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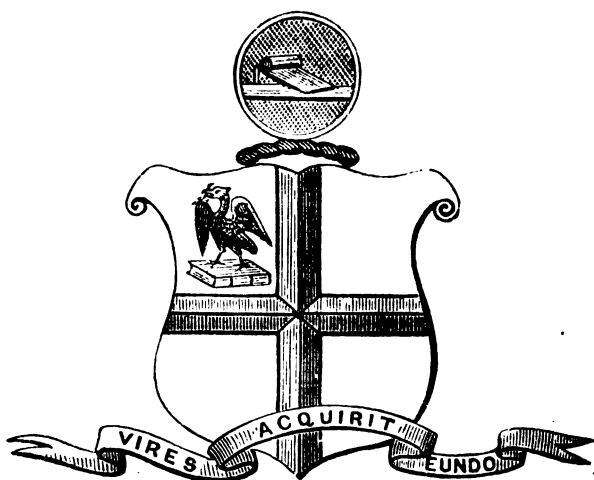
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PROCEEDINGS
 OF THE
 LITERARY AND PHILOSOPHICAL SOCIETY
 OF
 LIVERPOOL,
 DURING THE
 SEVENTIETH SESSION, 1880-81.

No. XXXV.



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- Nov. 12, 1877 Atkinson, John, *Manchester-street.*
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- Nov. 15, 1875 Bellis, William, *Sunny Bank, Victoria Park, Wavertree.*
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- Nov. 4, 1867 Bramwell, Ed., *Cowley Hill, St. Helens.*
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- Oct. 30, 1876 Bulman, Richard, 2, *India-buildings, Water-street.*
- April 18, 1864 Burne, Joseph, *Royal Insurance Office*, 1, *North John-street*, and *Higher Tranmere.*
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- Nov. 18, 1876 Carson, Thomas, M.D., 322, *Upper Parliament-street.*
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- Dec. 18, 1875 Cowell, Peter, *Free Library, William Brown-street.*
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- Nov. 27, 1868 Dove, John M., *Claughton.*
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- Mar. 21, 1870 Edwards, Edward E. (Smith, Edwards & Co.), *Adelaide-buildings, 4, Chapel-street.*
- April 7, 1862 English, Charles J., 26, *Chapel-street, and 26, Falkner-square.*
- April 20, 1874 English, Robert A., 26, *Falkner-square.*
- Dec. 1, 1879 Eyre, Edmund Phipps, 1, *Cook-street.*
- *Dec. 13, 1852 Ferguson, William, F.L.S., F.G.S., *Kinmundy House, near Mintlaw, N.B.*
- Nov. 15, 1875 Fleming, E. L., F.C.S., *Borax Works, Old Swan.*

- Oct. 1, 1866 Fletcher, Alfred E., F.C.S., H.M. Inspector of Alkali Works for the Western District, 5, *Edge-lane*.
- *Mar. 19, 1855 Foard, James Thomas, 3, *Harcourt-buildings, Temple, London, E.C.*
- Nov. 16, 1874 Fothergill, Charles George, 41, *Rodney-street*.
- Jan. 12, 1874 Frost, John Pownall, 10, *North John-street*.
- Nov. 12, 1877 Galley, Jno., 8, *Newstead-road*.
- Nov. 29, 1875 Gardner, William, *Ash Lea, Oak Hill Park*.
- Nov. 26, 1877 Gatty, Charles T., Mayer Museum, Free Public Museum, *William Brown-street*.
- *Feb. 6, 1854 Gee, Robert, M.D. Heidelb., M.R.C.P., Lecturer on Diseases of Children, Royal Infirmary School of Medicine; Physician Workhouse Hospital, 5, *Abercromby-square*.
- Oct. 20, 1879 Gracey, Robert, F.C.S. (Messrs. Cope Brothers), *Lord Nelson-street*.
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- Nov. 14, 1858 Greenwood, Henry, 32, *Castle-street*, and *Stanley Park*.
- Nov. 16, 1874 Grindley, Benjamin H., *Albion Office, School-lane*.
- Nov. 16, 1874 Guthrie, Malcolm, 2, *Parkfield-road*.
- Jan. 22, 1855 Hakes, James, F.R.C.S., 30, *Hope-street*.
- Oct. 18, 1875 Hale, Philip A., Bank of England, *Castle-street*.
- Oct. 21, 1872 Halliwell, Joseph, 10, *College-lane*.
- *Jan. 21, 1856 Hardman, Lawrence, 35, *Rock Park, Rock Ferry*.
- Dec. 13, 1875 Harpin, E., 46, *Onslow-road, Elm Park, Fairfield*.
- Nov. 30, 1874 Harvey, Henry, M.B., *High-street, Wavertree*.
- Feb. 6, 1865 Hassan, Rev. E., 2, *Olive Mount, Wavertree*.
- Nov. 13, 1865 Hayward, John Williams, M.D., 117, *Grove-street*.
- Feb. 6, 1865 Hebson, Douglas, 13, *Tower Chambers*, and 58, *Bedford-street South*.
- March 7, 1880 Hess, Leonard O., 51, *Bedford-street*.
- Nov. 4, 1872 Hicks, John Sibley, L.R.C.P., 2, *Erskine-street*.

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Exchange-buildings.
- Nov. 16, 1863 Holden, Adam, 48, *Church-street*, and 2, *Carlton-
terrace*, *Milton-road*.
- March 9, 1868 Holme, James, 10, *Huskisson-street*, and *Eldon
Chambers*, *South John-street*.
- Nov. 30, 1874 Holme, Rev. Arthur P., *Tattenhall*, near *Chester*.
- *Dec. 14, 1862 Holt, Robert Durning, 6, *India-buildings*, and 29,
Edge-lane.
- April 9, 1877 Hooper, Richard Bennett, 6, *Loudon Grove*, *North
Hill-street*.
- Nov. 4, 1878 Howie, J. Muir, M.B., *Rodney-street*.
- March 10, 1879 Hughes, John W., *Hornby-road*, *Wavertree*.
- Jan. 24, 1876 Hughes, Lewis, 38, *St. Domingo-vale*, *Everton*.
- *Nov. 13, 1854 Hunter, John, Member Historic Society, Pennsylv-
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- *April 29, 1850 Ihne, William, Ph.D. Bonn, *Villa Felseck*, *Heidel-
berg*, EX-PRESIDENT.
- Oct. 19, 1874 Imlach, Francis, M.D., 153, *Bedford-street South*.
- Jan. 26, 1863 Johnson, Richard C., F.R.A.S., 22 *Queen-
buildings*, *Dale-street*, and 19, *Catherine-street*,
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- Oct. 21, 1878 Johnson, John Hampden, 22, *Queen-buildings*,
11, *Dale-street*.
- Dec. 15, 1879 Johnson, Stuart M., 79, *Hutchinson-street*.
- Feb. 24, 1868 Jones, Charles W., *Field House*, *Wavertree*.
- *April 4, 1852 Jones, Morris Charles, F.S.A., F.S.A.Scot, *Gun-
grog*, *Welshpool*.
- Oct. 18, 1869 Jones, William Bolton, 20, *South Castle-street*.
- Nov. 30, 1874 Joseph, Rev. Morris, 67, *Canning-street*.
- Oct. 21, 1878 Ker, R. Wilson, 151, *Bedford-street South*.
- Nov. 1, 1869 Kinsman, W. N., 8, *Derwent-road*, *Stoneycroft*.

- Jan. 27, 1879 Kynaston, J. W., 149, *Kensington*.
- Oct. 21, 1844 Lear, John, *Stoneby Cottage, Stoneby Green, New Brighton*.
- Nov. 8, 1878 Lee, Hamilton (Messrs. Lee & Nightingale), *North John-street*.
- Nov. 8, 1878 Lee, Harold (Messrs. Lee & Nightingale), *North John-street*.
- Dec. 11, 1871 Leigh, Richmond, M.R.C.S., L.S.A., Physician to St. George's Hospital for Diseases of the Skin, 105, *Park-road*, *HON. LIBRARIAN*.
- Dec. 1, 1879 Long, Rev. R. E., *Cambridge House, Upper Parliament-street*.
- Jan. 18, 1879 Longuet-Higgins, Henry, *Rainhill*.
- Feb. 7, 1881 Lovell, John, 17, *Gambier-terrace*, and "*Mercury*" *Office, Wood-street*.
- Nov. 17, 1879 Lunt, Rev. Thomas, 97, *Everton-road*.
- Nov. 1, 1875 Lutschaunig, Alfred, *Blockley's-buildings, South John-street*.
- April 17, 1865 McCheane, Wm., M.R.C.S., 47, *Shaw-street*.
- March 28, 1874 McCulloch, D. B., 28, *Queen-buildings, Dale-street*.
- Oct. 30, 1876 McGrath, T. J., M.D., *St. James's-road*.
- Nov. 1, 1880 Maitland, H. D., 19, *Deane-road, Fairfield*.
- Nov. 14, 1870 Marples, Joseph, 23, *Leece-street*, and *Carlton-road, Tranmere*.
- Nov. 17, 1878 Marples, Josiah, *Melvill Chambers, Lord-street*, and *Broomfield, Egremont*.
- Feb. 19, 1877 Marples, William, 8, *Mathew-street*, and *Alfred road, Birkenhead*.
- Feb. 9, 1874 Marsden, Peter Crook, *Lymefield, Heaton, near Bolton*.
- Jan. 21, 1889 Martin, Studley, 27, *Brown's-buildings*, and 177, *Bedford-street South*.
- Feb. 20, 1871 Mason, Alfred H., F.C.S., Lond. and Berlin, 56 *Hanover-street*.
- Oct. 20, 1879 McArthur, Charles, F18, *Exchange-buildings*.
- Nov. 17, 1878 Mellor, James, Jun., *Weston, Blundellsands*.

- Dec. 14, 1874 Mellor, John, *Stansty, Waterloo Park, Waterloo.*
- Oct. 20, 1879 Mellor, Thomas, *Edgewater, Blundellsands.*
- Oct. 31, 1859 Moore, Thomas John, Corr. Mem. Z.S.L., Curator,
Free Public Museum, *William Brown-street,*
VICE-PRESIDENT.
- Nov. 15, 1869 Morgan, Alfred, 57, *Seel-street,* and 97, *Hartington-
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- Nov. 1, 1880 Morrow, John, 73, *Canning-street.*
- Jan. 8, 1855 Morton, Geo. Highfield, F.G.S., 122, *London-
road.*
- April 16, 1849 Moss, Rev. John James, B.A., *East Lydford Hall,*
Somerton, Somerset.
- Oct. 29, 1850 Mott, Albert Julius, F.G.S., *Adsett Court, West-
bury-on-Severn, EX-PRESIDENT.*
- April 3, 1854 Mott, Charles Grey, 27, *Argyle-street, Birkenhead,*
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- Dec. 16, 1878 Murphy, Rev. P., *St. Anthony's, Scotland-
road.*
- *Oct. 21, 1867 Muspratt, E. K., *Seaforth Hall, Seaforth.*
- Oct. 20, 1865 Nevins, John Birkbeck, M.D.Lond., M.R.C.S.,
Late Lecturer on *Materia Medica*, Royal
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- Feb. 6, 1865 Newton, John, M.R.C.S., 20, *Marmaduke-street,*
Edge-hill.
- Feb. 18, 1878 Nicholson, Robert, 11, *Harrington-street.*
- Nov. 2, 1868 Norrie, Rev. B. A. W., M.A. Cantab., *The College
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London, W.
- Jan. 8, 1877 Ogston, James, *Maresfield, Wavertree.*
- Dec. 18, 1866 Owen, Peter (Farnworth & Jardine), *Liverpool
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- Nov. 2, 1874 Palmer, John Linton, F.S.A., F.R.G.S., Fleet
Surgeon, R.N, 24, *Rock Park, Rock Ferry.*
- Dec. 15, 1873 Parnell, E. W., 32, *Canning-street.*

- Mar. 19, 1877 Parry, J. F., *Sandon-terrace*.
- Jan. 9, 1871 Patterson, J., 16, *Devonshire-road, Prince's Park*.
- Nov. 4, 1861 Philip, Thomas D., 49, *South Castle-street, and Holly-road, Fairfield*.
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- Nov. 1, 1875 Picton, William Henry, *Woodlea, Waterloo Park, Waterloo*.
- Feb. 24, 1879 Plastow, William, 888, *Scotland-road*.
- Nov. 15, 1880 Pollard, Dr., 52, *Rodney-street*.
- April 30, 1866 Prag, Rev. Jacob, 99, *Upper Warwick-street*.
- Nov. 18, 1871 Proctor, Peter, M.R.C.S., and L.S.A.Lond., 17, *Hamilton-square, Birkenhead*.
- March 4, 1878 Radcliffe, David 26, *Huskisson-street*.
- *Jan. 22, 1866 Raffles, William Winter, *Sunnyside, Prince's Park, and Glan-y-mor, Penmaenmawr*.
- Nov. 12, 1860 Rathbone, Philip H., *Liverpool and London Chambers (H), and Greenbank Cottage, Wavertree*.
- March 24, 1862 Rathbone, Richard Reynolds, 17, *Lancaster-buildings, Tithebarn-street, and Beechwood House, Grassendale*.
- *Jan. 7, 1856 Rawlins, Charles Edward, 12, *Rumford-court, Rumford-place, and Rock Mount, Rainhill*.
- Jan. 9, 1870 Rawlins, Gerald W., *Brook Cottage, Rainhill*.
- Jan. 7, 1878 Read, Robert, 28, *Berkeley-street*.
- Nov. 17, 1851 Redish, Joseph Carter, *Lyceum, Bold-street*.
- Nov. 29, 1869 Roberts, Isaac, F.G.S., *Kennessee, Maghull*.
- Dec. 4, 1876 Roberts, Richard (Messrs. Roberts & Son), 18, *Hackins-hey, and Mossley-hill*.
- Nov. 26, 1877 Roberts, J. Geo., L.D.S., R.C.S.I., 27, *Hope-street*.
- Feb. 4, 1867 Robinson, Joseph F., 1, *Knowsley-buildings, Tithebarn-street*.
- Oct. 4, 1869 Rogers, J. Frederick, 7, *Victoria-street, and 22, Ullet-road, Prince's Park*.

- Jan. 10, 1876 Rogerson, George Russell, F.R.A.S., F.R.G.S.,
F.R.S.L., *Cook-street*, and *Allerton*.
- Oct. 21, 1878 Roose, Edward B., 26, *North John-street*.
- Oct. 29, 1877 Rosenheim, Jos. C., *Sunny Bank, Prince's Park*.
- April 18, 1854 Rowe, James, 14, *South Castle-street*, and 105,
Shaw-street.
- Jan. 22, 1872 Russell, Edward R., "*Daily Post*" Office, *Victoria-*
street, and 58, *Bedford-street*, PRESIDENT.
- Feb. 18, 1878 Russell, W., *Compton Hotel, Church-street*.
- April 7, 1862 Samuel, Harry S., 11, *Orange-court*, and 2,
Canning-street.
- Nov. 30, 1874 Samuel, William Hy., 145, *Upper Parliament-st.*
- Nov. 29, 1880 Sang, Walter, 8, *Brompton-avenue, Sefton Park*.
- Oct. 18, 1880 Schack-Sommer, Dr. (Messrs. Crosfield, Barrow &
Co.), 328, *Vauxhall-road*, and 72, *Rodney-*
street.
- March 19, 1866 Sephton, Rev. John, M.A., *Liverpool Institute*.
- Dec. 2, 1878 Serjeant, Jno., 128, *London-road*.
- Nov. 2, 1868 Sharp, Charles, *Liverpool Institute*.
- Jan. 7, 1878 Shearer, George, M.D., 178, *Upper Parliament-*
street.
- Nov. 16, 1863 Sheldon, E. M., M.R.C.S., 223, *Boundary-street*.
- Oct. 18, 1875 Simpson, James, 10, *Rumford-place*.
- Nov. 7, 1864 Skinner, Thomas, M.D. Edin.
- Jan. 26, 1880 Skinner, Hilton.
- Nov. 4, 1878 Slater, William, 5, *Tithebarn-street*.
- Dec. 10, 1866 Smith, Elisha (Henry Nash & Co.), 12, *Tower-*
buildings North.
- April 4, 1870 Smith, James, 9, *Lord-street*, and *Ribblesdale*
Villas, 22, *Merton-road, Bootle*.
- Feb. 28, 1863 Smith, J. Simm, 1, *Warham-road, Croydon*.
- Feb. 24, 1862 Snape, Joseph, Lecturer on Dental Surgery,
Royal Infirmary School of Medicine, 75,
Rodney-street.
- Nov. 27, 1877 Snape, Thos., 10, *Kinglake-street, Edgehill*.
- April 20, 1874 Snow, Rev. T., M.A., 55, *Seel-street*.

- Dec. 2, 1878 Southward, Rev. W. T., M.A., Fellow of St. Catharine's College, Cambridge, *White House, Huyton.*
- Nov. 18, 1878 Sparke, Morton, *Charlwood House, Tarbuck-road, Roby.*
- Nov. 12, 1860 Spence, Charles, 4, *Old Hall-street.*
- Feb. 10, 1862 Spence, James, 18, *Brown's-buildings, Exchange, and 10, Abercromby-square.*
- Jan. 18, 1868 Stearn, C. H., 3, *Eldon-terrace, Rock Ferry.*
- Nov. 18, 1878 Steel, Richard, 18, *Hackins Hey.*
- Nov. 18, 1876 Stephens, Thomas English, *Seafield, Victoria-road, New Brighton.*
- Oct. 24, 1876 Stern, Rev. William, D.D., 3, *Hope-place.*
- Nov. 1, 1875 Stevenson, John, *Prince Alfred-road, Wavertree.*
- Jan. 9, 1865 Stewart, Robert E., L.D.S., R.C.S., Dental Surgeon Royal Southern Hospital and Liverpool Dental Hospital, 37, *Rodney-street.*
- Nov. 29, 1880 Sword, Patrick, *Aughton, near Ormskirk.*
- Feb. 18, 1878 Symes, Charles, Ph.D., 20, *St. James's-road.*
- Feb. 18, 1878 Taylor, Geo., 23, *Seel-street.*
- *Feb. 19, 1865 Taylor, John Stopford, M.D.Aberd., F.R.G.S., 2, *Millbank-terrace, Anfield-road.*
- Nov. 29, 1875 Tetley, John H., *Sunnyside, 21, Rock Park, Rock Ferry.*
- Feb. 19, 1877 Thacker, Reginald P., *Mandeville, Aigburth-road.*
- Oct. 21, 1878 Thompson, J. W., B.A.Lond., 22, *Lord-street.*
- March 8, 1880 Tickle, W. H., *Cretan House, Oak Hill Park.*
- Nov. 17, 1850 Tinsling, Chas., *Victoria-street, and 29, Onslow-road, Elm Park.*
- Dec. 4, 1876 Torpy, Rev. Lorenzo, M.A., *Borrowash, Derby.*
- *Feb. 19, 1844 Turnbull, James Muter, M.D.Edin., M.R.C.P., 86, *Rodney-street.*
- Oct. 21, 1861 Unwin, William Andrew, 11, *Rumford-place.*
- Oct. 20, 1879 Veevers, Samuel, *Huyton.*
- Nov. 15, 1880 Vicars, John, 29, *Seel-street.*

- Feb. 24, 1879 Walker, R. S., J.P., Resident Secretary, General Insurance Co., 5, *Brunswick-street*.
- Mar. 18, 1861 Walker, Thomas Shadford, M.R.C.S., 88, *Rodney-street*.
- Jan. 27, 1862 Walmsley, Gilbert G., 50, *Lord-street*.
- Jan. 9, 1865 Walthew, William, *Phœnix Chambers*, and *Vine Cottage, Aughton*.
- Feb. 19, 1877 Wallace, John, M.D., *Gambier-terrace*.
- March 4, 1872 Ward, Thomas, *Brooklands House, Northwich*.
- Dec. 2, 1861 Weightman, William Henry, *Minster-buildings, Church-street*, and *Cambridge-road, Seaforth*.
- Oct. 30, 1876 Weightman, Arthur (Messrs. Field & Weightman), *Talbot Chambers, 3, Fenwick-street, W.*
- Dec. 13, 1880 Whitford, Wm., M.D., 37, *Shaw-street*.
- April 7, 1862 Whittle, Ewing, M.D., Lecturer on Medical Jurisprudence Royal Infirmary School of Medicine, 77A, *Upper Parliament-street*.
- Nov. 2, 1874 Wolf, Jas. O. de (Messrs. T. C. Jones & Co.), 26, *Chapel-street*.
- March 18, 1861 Wood, George S. (Messrs. Abraham & Co.), 20, *Lord-street*, and *Bellevue-road, Wavertree*.
- Nov. 14, 1870 Wood, John J. (Messrs. Abraham & Co.), 20, *Lord-street*.
- Nov. 29, 1875 Yates, D. E., 9, *Rumford-place*, and 38, *Huskisson-street*.
- Nov. 18, 1876 Yates, Edward Wilson, 37, *Castle-street*.
- Nov. 2, 1874 Young, Henry, *South Castle-street*.

HONORARY MEMBERS.

LIMITED TO FIFTY.

- 1.—1838 The Right Hon. Dudley Ryder, Earl of Harrowby, K.G., D.C.L., F.R.S., etc., *Sandon Hall, Staffordshire*, and 39, *Grosvenor-square, London, W.*
- 2.—1836. The Most Noble William, Duke of Devonshire, K.G., M.A., F.R.S., D.C.L., F.G.S., etc., Chancellor of the University of Cambridge, *Chatsworth, Derbyshire*, and 78, *Piccadilly, London, W.*
- 3.—1838 Sir George Biddell Airy, K.C.B., M.A., LL.D., D.C.L., F.R.S., F.R.A.S., etc., *Royal Observatory, Greenwich.*
- 4.—1840 James Nasmyth, F.R.S., *Penshurst, Kent.*
- 5.—1844 T. B. Hall, *Crane House, Yarmouth.*
- 6.—1844 Peter Rylands, M.P., *Warrington.*
- 7.—1844 William B. Carpenter, M.D., F.R.S., F.L.S., Corresponding Member of the Institute of France, etc., *London.*
- 8.—1850 The Rev. Canon St. Vincent Beechy, M.A., Rector of Hilgay, *Norfolk.*
- 9.—1851 The Rev. Robert Bickersteth Mayor, B.D., Rector of Frating, *Essex.*
- 10.—1857 Thomas Joseph B. Hutchinson, F.R.G.S., F.R.S.L., F.E.S., *Ballinescar Lodge, Curracloe, co. Wexford.*
- 11.—1861 The Rev. Thomas P. Kirkman, M.A., F.R.S., Rector of Croft, *near Warrington.*
- 12.—1865 The Right Rev. T. N. Staley, D.D., late Bishop of Honolulu, Vicar of Croxhall, *Staffordshire.*
- 13.—1865 Sir Edward J. Reed, K.C.B., F.R.S., M.P., *Hextable, Dartford, Kent.*

- 14.—1865 Cuthbert Collingwood, M.A., M.B., F.L.S., 4, *Grove-terrace, Belvedere-road, Upper Norwood, London, S.E.*
- 15.—1867 J. W. Dawson, LL.D., F.R.S., etc., Principal and Vice-Chancellor of McGill University, *Montreal.*
- 16.—1868 Captain Sir James Anderson, 16, *Warrington-crescent, Maida Hill, London, W.*
- 17.—1870 Sir John Lubbock, Bart., M.P., F.R.S., etc., *High Elms, Farnborough, Kent.*
- 18.—1870 Professor Henry E. Roscoe, F.R.S., etc., *Owens College, Manchester.*
- 19.—1870 Sir Charles Wyville Thomson, F.R.S., etc., Professor of Natural History, *Edinburgh.*
- 20.—1870 Sir Joseph Dalton Hooker, M.D., F.R.S., etc.
- 21.—1870 Professor Brown Séquard, M.D.
- 22.—1870 John Gwyn Jeffreys, F.R.S., *Ware Priory, Herts.*
- 23.—1870 Professor Thomas H. Huxley, LL.D., F.R.S., etc., 4, *Marlborough-place, London, N.W.*
- 24.—1870 Professor John Tyndall, LL.D., F.R.S., etc., *Royal Institution, London.*
- 25.—1870 The Rev. Christian D. Ginsburg, LL.D., *Binfield, Bracknell, Berks.*
- 26.—1874 Professor Alexander Agassiz, Director of the Museum of Comparative Zoology, *Harvard, Cambridge, Massachusetts.*
- 27.—1874 Professor Frederick H. Max Müller, LL.D., *Oxford.*
- 28.—1874 Sir Samuel White Baker, Pasha, F.R.S., F.R.G.S., etc., *Sandford, Orleigh, Newton Abbot, Devonshire.*
- 29.—1877 Professor F. V. Hayden, M.D., etc., Director of the United States Geological and Geographical Survey of the Territories, *Washington.*
- 30.—1886 Alfred Higginson, M.R.C.S., 185, *Tulse Hill, London,* also an Ordinary Life Member.
- 31.—1877 Earl of Crawford and Balcarres, F.R.S., Foreign Secretary of R.A.S., etc., 9, *Grosvenor-square, London.*

- 82.—1877. Albert C. L. Günther, M.A., M.D., Ph.D., British Museum.
- 83.—1877 Adolphus Ernst, M.D., Principal of the Department of Science, Philosophy, and Medicine, *Caraccas*.
- 84.—1877 Dr. Leidy, Academy of Science, *Philadelphia*.
- 85.—1877 Dr. Franz Steindachner, Royal and Imperial Museum, *Vienna*.
- 86.—1877 The Rev. H. B. Tristram, M.A., LL.D., F.R.S., Canon of Durham, *The College, Durham*.
- 87.—1880 Joseph Mayer, F.S.A., *Pennant House, Bebington*.

CORRESPONDING MEMBERS.

LIMITED TO THIRTY-FIVE.

- 1.—1867 J. Yate Johnson, *London*.
- 2.—1867 R. B. N. Walker, *West Africa*.
- 3.—1868 Rev. J. Holding, M.A., F.R.G.S., *London*.
- 4.—1868 George Hawkins, *Colombo, Ceylon*.
- 5.—1868 J. Lewis Ingram, *Bathurst, River Gambia*.
- 6.—1869 George Mackenzie, *Cebu, Philippine Islands*.
- 7.—1870 Rev. Joshua Hughes-Games, D.C.I., King William's College, *Isle of Man*.
- 8.—1874 Samuel Archer, Surgeon-Major, *Singapore*.
- 9.—1874 Coote M. Chambers, *Burrard's Inlet, British Columbia*.
- 10.—1874 Edwyn C. Reed, *Santiago de Chili*.
- 11.—1874 Millen Coughtrey, M.D., *Dunedin, Otago, New Zealand*.
- 12.—1875 Robert Gordon, Government Engineer, *British Burmah*.
- 13.—1877 Edward Dukinfield Jones, C.E., *Sao Paulo, Brazil*.
- 14.—1877 Miss Horatio T. Gatty, *Ecclesfield Vicarage, Wakefield*.
- 15.—1877 Dr. Allen, *Jamaica*.
- 16.—1877 Dr. George Bennett, *Sydney*.
- 17.—1877 Dr. David Walker, *Benicia, U.S.A.*

ASSOCIATES

LIMITED TO TWENTY-FIVE.

- 1.—Jan. 27, 1862 Captain John H. Mortimer, "America."
(Atlantic.)
- 2.—Mar. 24, 1862 Captain P. C. Petrie, "City of London,"
Commodore of the Inman Line of American
Steam Packets. (Atlantic.)
- 3.—Feb. 9, 1868 Captain James P. Anderson, Cunard
Service. (Atlantic.)
- 4.—Feb. 9, 1868 Captain John Carr (Bushby & Edwards),
ship "Scindia." (Calcutta.)
- 5.—Feb. 9, 1868 Captain Charles E. Price, R.N.R. (L. Young
& Co.), ship "Cornwallis." (Calcutta
and Sydney.)
- 6.—April 20, 1868 Captain Fred. E. Baker, ship "Nippon."
(Chinese Seas.)
- 7.—Oct. 31, 1864 Captain Thomson, ship "Admiral Lyons."
(Bombay.)
- 8.—April 13, 1865 Captain Alexander Cameron (Boult, English,
& Brandon), ship "Staffordshire."
(Shanghai.)
- 9.—Dec. 11, 1865 Captain Walker, ship "Trenton."
- 10.—Mar. 28, 1868 Captain David Scott.
- 11.—Oct. 5, 1868 Captain W. H. Cawne Warren, ship "Bed-
fordshire."
- 12.—Mar. 22, 1869 Captain Robert Morgan, ship "Robin
Hood."
- 13.—April 29, 1872 Captain J. B. Walker, Old Calabar.

- 14.—April 29, 1872 Captain Alfred Horsfall, S.S. "Canopus."
- 15.—Oct. 18, 1875 Captain John Slack.
- 16.—Feb. 19, 1877 Arthur B. Nevins, Melbourne.
- 17.—Dec. 2, 1878 Captain C. A. Sibthorpe, S.S. "European."
- 18.—Dec. 2, 1878 Captain A. T. Cooper, P. S. N. Co.'s
"Illimani."

VOLUMES PRESENTED TO THE LIBRARY DURING THE
SEVENTIETH SESSION, 1880-1881.

A.

- Acids, On the Ethocrotonic, and the Mono-Acid Dibromdiethacetic
Acids, by Allen B. Howe, Troy, N.Y., 1879.
Amphitroonis Plavtinae (Particula Prior) Fragmentis Scriptis
Johannes Schroeder, Argentorati, 1879.
Arts, Journal of the Society of. London, 1880.
Architects, Proceedings of the Royal Institution of British.
Ashmolean Society, List of the, 1880.
Astronomical Society, Royal. Monthly Notices, 1880.
Astronomy and Barometric Hypsometry. United States Geo-
graphical Survey, Washington, 1880.
Asiatic Society, Bombay Branch of the Royal. Journal, vol. xiv.

B.

- Berkeley, Kants Urtheile über, von Julius Janitoch, Strassburg, 1879.
Botany, United States Geographical Survey, Washington, 1880.
Botany, Journal of the Linnæan Society.

C.

- Chemical Society, Journal of the, London, 1880.

D.

- Datini De usu apud Priscos Scriptores Latinos ad omnes in Philo-
sophia Honores. Scripsit Henricus Peine saxo borussus,
Argentorati, 1878.
Diphenylbasen, Diphenole und Diphenylbenzole, Beiträge zur
Kenntniss des, von Hermann Schmidt, Hanover, 1879.

Diheptylsubstituirte Acetessigäther und deren Spaltungsprodukte
Neber Mono-und, von Friedrich Jourdan, Mainz, 1879.

Desmidiaceen Os Ipreeussens, Neber die Formen einiger Gattungen
der, von George Klebs, Königsberg, 1879.

E.

Einfluss des Reimes auf die sprache otfrids, Überden, von Theodor
Ingenbleek, Strassburg, 1880.

Engineers, Annual Report of the Chief of, United States Geogra-
phical Survey, Washington, 1880.

Engineers, Institute of Civil. Proceedings, vol. lxii., London.

F.

Flexionslehre, De Laut-und, der Mittelkentischen Denkmäler, von
Otto Dantier, Strassburg, 1879.

Fluoranthens und seiner Derivate, Beiträge zur Kenntniss des, von
Henry Liepmann, Strassburg, 1879.

Florida Reefs, Report on the, by Louis Agassiz.

G.

Gebüsgh, Über ein Specielles, van Fläghen zweiter ordnung von
Richard Krausse, Strassburg, 1879.

Geological Society, London, List of the, 1880. Quarterly Journal
of the, 1880.

Geographical Survey, United States, West of 100th Meridian,
Washington, 1880.

H.

Halicarnassensis, De Dionysii, scriptis rhetoricis Quaestiones
Criticae, scriptis Leonardus Sadée sedinensis, Argentorati,
1878.

Hydrosorbinsäure, Neber die Constitution der, von Ludwig
Landsberg, Strassburg, 1879.

Harmosum und Desmin, Neber den Phillipsit und seine Bezie-
hungen zum, von Theodor Wilhelm Fresenius, Leipzig, 1878.

Harvard University, Library Bulletin, October, 1880.

Historic Society of Lancashire and Cheshire, Transactions of the,
vol. xxxii.

I.

Institution, Proceedings of the London Royal.

Institute, Journal of the Franklin, Philadelphia, 1880.

Iceland Spar, Double Refraction and Dispersion in, by R. J.
Glazebrook, M.A.

K.

Kongelige Nordisk, Udgivet af det, Oldskrift Selskab Kjobenhaun,
1878-79.

L.

Libraries, Free Public. Annual Report, Manchester, 1879-80.

Libraries, Free Public. Annual Report, Liverpool, 1881.

Literary and Philosophical Society, Manchester. Memoirs and
Proceedings.

Literary and Philosophical Society, Whitby. Report, 1880.

Linnæan Society, Journal of the, London, 1880.

M.

Modalis, De Qui Localis, apud Priscos Scriptores Latinos usu
Scripsit Otto Kienitz gorlicensis, Lipsiae, 1879.

Morungen, Heinrich von, und die Troubadours von Ferdinand
Michel, Strassburg, 1879.

Mehrlantigen Bildungen im Arabischen, Beiträge zur erklärang der,
von Siegmund Fraenkel, Frankfort à Oder, 1878.

Microscopical Society, Journal of the Royal, London.

Medico Chirurgical Society, Transactions of the, London, 1880.

Montgomeryshire, Collections Historical and Archæological relating
to. No. 8, vol. xiii. Powys-Land Club, London, 1880.

Meteorological Society, The British. Quarterly Journal, London,
1880.

N.

Naturalists' Field Club, Proceedings of the Berwickshire, 1879.

Nicol's Prism, Notes on, by R. J. Glazebrook, M.A.

Nature. 1880.

Natural History and Philosophical Society, Belfast. Proceedings, 1878-1880.

O

Ordinarium, De Diebus Contionum, apud Athenienses, Scriptis Adam Reusch. Argentorati, 1879.

Oldkyndighed og Historie, Illaeg til Aarboger for Nordisk Aargang, 1877-1878.

Omori Shell Mounds, The. Salem, Mass, 1880.

Observations, Greenwich. London, 1878.

Ordinance, Annual Report of the Chief of. Washington, 1880.

P.

Pronom neutre Le, il en Langue D'Oil. Adolf Horning. Bonn, 1879.

Psalter, Vocalismus and Consonantisenus in Oxforde, von Friedrich Harseim. Bonn, 1879.

Philosophical and Literary Society, Leeds, Annual Report, 1879-80.

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Polytechnique, Journal de L'Ecole, Paris, tome xxviii.

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Pinnipeds, North American, by J. Allen. Washington, U.S., 1880.

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S.

Sermonis De Proprietatibus, quae leguntur apud Cornificium et in primis Ciceronis Libris Scripsit. Philippus Thielmann caesarea-lutrensis. Argentorati, 1879.

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- Science, Journal of. London, 1880.
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 Science Gossip, 1880.
 Society, Proceedings of the Royal, London, 1880.
 Statistical Society, Journal of the, London.
 Somersetshire Archeological and Natural History Society, Proceedings. Vol. Taunton, 1880.

T.

- Tiglinsäure und Angelicasäure-Untersuchungen über, von Alexander Paganstecher. Strassburg, 1879.
 Terpene, Beiträge zur Kenntniss der. Fr. Gruenling. Strassburg, 1879.

Z.

- Zoological Society, Proceedings of the, London, 1880.
 Zoology. Journal of the Linnæan Society.

LIST OF SOCIETIES, ACADEMIES, INSTITUTIONS, ETC.,
TO WHICH THIS VOLUME IS PRESENTED.

(The Asterisk denotes those from which Donations have been received this Session.)

<i>Aberdeen</i>	The Dun-Echt Observatory.
<i>Alnwick</i>	*The Berwickshire Naturalists' Field Club.
<i>Amsterdam</i>	Der Koninklijke Akademie van Wetenschappen afdeeling Naturkunde
<i>Bath</i>	*The Natural History and Antiquarian Field Club.
<i>Belfast</i>	*The Naturalists' Field Club.
<i>Belfast</i>	The Natural History and Philosophical Society.
<i>Birkenhead</i>	The Free Public Library.
<i>Birkenhead</i>	The Literary and Scientific Society.
<i>Bombay</i>	*The Royal Asiatic Society.
<i>Bordeaux</i>	La Société des Sciences Physiques et Naturelles
<i>Boston (Mass.)</i>	*The American Academy of Arts and Sciences.
<i>Boston (Mass.)</i>	*The Natural History Society.
<i>Boston (Mass.)</i>	The Massachusetts Board of Agriculture.
<i>Boston (Mass.)</i>	The Massachusetts Board of Education.
<i>Boston (Mass.)</i>	The Massachusetts Board of State Charities.
<i>Boston (Mass.)</i>	*The Massachusetts Board of Health.
<i>Boston (Mass.)</i>	The Free Public Library.
<i>Bristol</i>	The Naturalists' Society.
<i>Brussels</i>	L'Académie Royal des Sciences, des Lettres, et des Beaux-Arts de Belgique.

- Buffalo (N.Y.)* . . . The Society of Natural Sciences.
- Burlington (Vt.)* . . . The Orleans County Society of Natural Sciences.
- Calcutta* The Asiatic Society of Bengal.
- Calcutta* *The Geological Survey of India.
- Cambridge* The Philosophical Society.
- Cambridge* The Union Society.
- Cambridge (Mass.)* . *The Harvard University.
- Cambridge (Mass.)* . The Museum of Comparative Zoology.
- Cambridge (Mass.)* . The Peabody Museum of American Archaeology.
- Cherbourg* *La Société Imperiale des Sciences Naturelles.
- Chester* The Natural History Society.
- Chester* The Architectural and Archæological Society.
- Chicago* The Free Public Library.
- Christiana* The University.
- Coldwater (Mich.)* . The Michigan Library Association.
- Copenhagen* L'Académie Royale.
- Copenhagen* La Société Royale des Antiquaries du Nord.
- Davenport (Iowa)* . The Academy of Natural Sciences.
- Dublin* The Royal Irish Academy.
- Dublin* *The Royal Geological Society of Ireland.
- Dublin* The Royal Society.
- Edinburgh* The Royal Scottish Society of Arts.
- Edinburgh* *The Botanical Society.
- Edinburgh* The Royal Observatory.
- Edinburgh* *The Meteorological Society of Scotland.
- Edinburgh* The Royal Physical Society.
- Edinburgh* *The Royal Society.
- Edinburgh* The Philosophical Institution.
- Edinburgh* *The Geological Society.
- Falmouth* *The Royal Cornwall Polytechnic Society.
- Geneva* La Société de Physique et d'Histoire Naturelle.
- Gireswald* The University.
- Glasgow* *The Philosophical Society.

<i>Glasgow</i>	The Geological Society.
<i>Göttingen</i>	Der Königlichen Gesellschaft der Wissen- schaften.
<i>Greenwich</i>	The Royal Observatory.
<i>Haarlem</i>	Der Koninklijke Akademie van Witten- schappen.
<i>Halifax</i>	The Literary and Philosophical Society.
<i>Helsingfors</i>	Der Finska Vetenskaps Societetens.
<i>Hull</i>	*The Literary and Philosophical Society.
<i>Königsberg</i>	Der Königlichen Physikalisch-ökonomischen Gesellschaft.
<i>London</i>	*The Society of Arts.
<i>London</i>	*The Royal Asiatic Society.
<i>London</i>	*The Society of Antiquaries.
<i>London</i>	*The Anthropological Institute.
<i>London</i>	*The Royal Astronomical Society.
<i>London</i>	The British Association.
<i>London</i>	The British Museum.
<i>London</i>	The Chemical Society.
<i>London</i>	The Clinical Society.
<i>London</i>	The Royal Geographical Society.
<i>London</i>	*The Geological Society.
<i>London</i>	The Geologists' Association.
<i>London</i>	*The Linnæan Society.
<i>London</i>	*The British Meteorological Society.
<i>London</i>	The Royal Society of Literature.
<i>London</i>	*The Royal Society.
<i>London</i>	The Royal Institution.
<i>London</i>	The Statistical Society.
<i>London</i>	*The Medico-Chirurgical Society.
<i>London</i>	*The Institution of Civil Engineers.
<i>London</i>	*The Royal Institute of British Architects.
<i>London</i>	*The Royal Microscopical Society.
<i>London</i>	*The East Indian Association.
<i>London</i>	*The Zoological Society.
<i>London</i>	*The Editor of "Nature."

<i>London</i>	*The Editor of "Quarterly Journal of Science."
<i>London</i>	*The Editor of "Science Gossip."
<i>London</i>	*The Editor of "Geological Magazine."
<i>Leeds</i>	The Philosophical and Literary Society.
<i>Leeds</i>	The Geological Society of the West Riding of Yorkshire.
<i>Leipzig</i>	Der Königlich-Sächsischen Gesellschaft der Wissenschaften.
<i>Leicester</i>	*The Literary and Philosophical Society.
<i>Liverpool</i>	The Architectural Society.
<i>Liverpool</i>	*The Historic Society.
<i>Liverpool</i>	*The Geological Society.
<i>Liverpool</i>	The Philomathic Society.
<i>Liverpool</i>	The Polytechnic Society.
<i>Liverpool</i>	*The Naturalists' Field Club.
<i>Liverpool</i>	The Microscopical Society.
<i>Liverpool</i>	The Chemists' Association.
<i>Liverpool</i>	The Numismatic Society.
<i>Liverpool</i>	The Royal Institution.
<i>Liverpool</i>	*The Free Public Library.
<i>Liverpool</i>	The Medical Institution.
<i>Liverpool</i>	The Lyceum News Room.
<i>Liverpool</i>	The Athenæum Library and News Room.
<i>Liverpool</i>	The Liverpool Library.
<i>Liverpool</i>	*The Powys-Land Club.
<i>Liverpool</i>	The Engineering Society.
<i>Manchester</i>	The Literary and Philosophical Society.
<i>Manchester</i>	The Free Public Library.
<i>Manchester</i>	The Chetham Library.
<i>Manchester</i>	The Owens College.
<i>Manchester</i>	The Literary Club.
<i>Melbourne</i>	The Royal Society of Victoria.
<i>Milan</i>	*La Reale Istituto Lombardo.
<i>Munich</i>	Der Königlichen Akademie der Wissenschaften.

<i>Newcastle-on-Tyne</i>	Natural History Society.
<i>New York</i>	*The Astor Library.
<i>New York</i>	*The American Geographical Society.
<i>New York</i>	*The Academy of Sciences.
<i>New York</i>	The City University.
<i>New York</i>	The State University.
<i>New York</i>	The State Library.
<i>New York</i>	The State Museum of Natural History.
<i>New Haven</i>	The Connecticut Academy of Arts and Sciences.
<i>Otago</i>	The University.
<i>Ottawa</i>	The Library of Parliament.
<i>Oxford</i>	The Ashmolean Society.
<i>Oxford</i>	The Union Society.
<i>Paris</i>	L'Ecole Polytechnique.
<i>Penzance</i>	*The Royal Geological Society of Cornwall.
<i>Philadelphia</i>	*The American Philosophical Society.
<i>Philadelphia</i>	The Academy of Natural Sciences.
<i>Philadelphia</i>	*The Franklin Institute.
<i>Philadelphia</i>	*The Zoological Society.
<i>Philadelphia</i>	*The Pennsylvania Board of Public Education.
<i>Plymouth</i>	*The Plymouth Institute.
<i>Salem (Mass.)</i>	*The Essex Institute.
<i>Salem (Mass.)</i>	*The American Association for the Advancement of Science.
<i>Southport</i>	The Literary and Philosophical Society.
<i>St. Petersburg</i>	L'Académie Imperiale des Sciences.
<i>Stockholm</i>	L'Académie Royale Suedoise des Sciences.
<i>Strasburg</i>	La Bibliothèque Municipale.
<i>Strasburg</i>	Die Kaiserliche Universitäts und Landesbibliothek.
<i>Sydney</i>	*The Royal Society of New South Wales.
<i>Taunton</i>	The Somersetshire Archæological Society.
<i>Toronto</i>	*The Canadian Institute.
<i>Truro</i>	*The Royal Institution of Cornwall.

- Vienna* Der Kaiserlichen Akademie der Wissenschaften.
- Vienna* *Der Geographischen Gesellschaft.
- Whitby* The Literary and Philosophical Society.
- Washington* . . . The Naval Observatory.
- Washington* . . . The Department of Agriculture.
- Washington* . . . *The Smithsonian Institution.
- Washington* . . . *The War Office:—The Ordnance Department; the Office of the Chief Signal Officer, U.S., Army; the Department of the Chief of Engineers, U.S. Army; the Department of the Paymaster-General, U.S. Army; the Department of the Surgeon-General, U.S. Army.
- Washington* . . . *The U.S. Geological and Geographical Survey of the Territories.
- Wellington, N.Z.* . *The New Zealand Institute.
- York* The Philosophical Society.

TREASURER'S ACCOUNT, 1879-80.

Dr. *The LITERARY AND PHILOSOPHICAL SOCIETY, in Account with R. C. JOHNSON, Treasurer.* Cr.

	£	s.	d.		£	s.	d.
1879-80.				1879-80.			
To Cash paid D. Marples & Co. Limited (Printing)	128	17	0	By Balance from last account :—			
" " Tinsling & Co. (Circulars)	9	13	6	Dock Bond	150	0	0
" " G. G. Walsley (Binding)	3	15	3	Cash	1	3	5
" " Doling (Refreshments)	31	9	0				151 3 5
" " Burke (Attendance)	1	10	0	By Cash from Subscriptions :—			
" " Rent of Room	20	0	0	14 Entrance Fees, at 10s. 6d.	7	7	0
" " Knott (Lantern Exhibition)	2	8	0	20½ Annual, at 21s.	211	11	6
" " Secretary (Expenses)	17	4	0	18 Arrears, at 21s.	18	18	0
" " " (Editorial Fee)	10	10	0				237 16 6
" " Treasurer (Expenses)	0	19	6	By Cash, Interest on Dock Bond			6 13 1
" " D. Morris, Subscription, entered in last account, but not received	2	13	6				
To Balance in hand (Dock Bond)	150	0	0				
" " (Cash)	16	13	3				
			166 13 3				
			<u>£395 12 0</u>				<u>£395 12 0</u>

Examined and found correct,
(Signed), ISAAC ROBERTS.
EDWARD DAVIES.

PROCEEDINGS
OF THE
LIVERPOOL
LITERARY AND PHILOSOPHICAL SOCIETY.

ANNUAL MEETING.—SEVENTIETH SESSION.

ROYAL INSTITUTION, October 4th, 1880.

EDWARD R. RUSSELL, PRESIDENT, in the Chair.

THE Minutes of the last Meeting of the preceding Session were read and confirmed.

The Honorary Secretary read the following

REPORT.

The Council of the Literary and Philosophical Society have only a very brief report to make to the members at the commencement of the seventieth Session, the course of the Society's Proceedings during the past year presenting no special features beyond those of recent years.

The Meetings, which are now nearly always graced by the presence of ladies, were well attended throughout the Session; the papers read fully sustained the Society's reputation, and in some instances were followed by remarkably able discussions; and the miscellaneous communications were original and valuable.

Owing to unavoidable delay in the preparation of some of the papers, the Volume for the last Session is not yet out of the printers' hands; but the Council are assured that it will be ready for distribution before the Christmas recess.

The number of Ordinary Members is slightly lower than it was at the beginning of the Session, although it is still in advance of previous years, and considerably above the average of the last ten years. There are now 246 Ordinary Members, of whom 18 are Life Members. Fifteen members were admitted during the Session, and within the same period the Society lost 24 members—one by death, and the remainder by removal from the neighbourhood, or other causes. The honoured name of one of these—that of Mr. Joseph Mayer—the Council feel sure the Society will not willingly permit to be removed from the roll of its Ordinary Members without the expression of its grateful appreciation of the great benefit Mr. Mayer has conferred upon the city by the gift of the Mayer Collection. They therefore recommend his election as an Honorary Member.

One of the Honorary Members, Count Pourtales, of Harvard College, has recently died; of the Corresponding Members, the term of the Rev. Dr. Jones (Hughes-Games), of King William College, Isle of Man, has expired, and it will be necessary to consider his re-election; the list of Associates remains unaltered.

The financial position of the Society, as will be shown by the Treasurer's Balance Sheet, is substantially the same as last year, and requires no further comment than this—that the pecuniary prosperity of the Society depends upon a rigid adherence to the estimates as presented at the Annual Meeting, and, the Council would add, upon the prompt payment of their subscriptions by the members.

The Report was adopted, on the motion of the President, seconded by Mr. W. H. SAMUEL.

The Hon. Treasurer next presented the Annual Statement of Accounts, which was also passed.

The following office-bearers were then elected:—

Vice-Presidents.—Thos. J. Moore, Cor. Mem. Z.S.L.,

Thomas Higgin, F.L.S., J. Campbell Brown, D.Sc., &c. Honorary Treasurer.—Richard C. Johnson, F.R.A.S. Honorary Secretary.—James Birchall. Honorary Librarian.—Richmond Leigh, M.R.C.S.E. Members of Council.—Edward Davies, F.C.S., George H. Morton, F.G.S., W. Carter, M.D., Alfred E. Fletcher, F.C.S., Isaac Roberts, F.G.S., John W. Hayward, M.D., Josiah Marples, G. F. Chantrell, C. H. Stearn, Richard Steel, Charles H. Beloe, M. Inst. C.E., George Shearer, M.D., J. Sibley Hicks, L.R.C.P., Peter Cowell.

Mr. Joseph Mayer, F.S.A., was elected an Honorary Member.

The Rev. Dr. Hughes-Games (late Jones), of King William's College, Isle of Man, was re-elected a Corresponding Member. The Associates were also re-elected.

The President then delivered his second Inaugural Address.*

FIRST ORDINARY MEETING.

ROYAL INSTITUTION, October 18th, 1880.

J. CAMPBELL BROWN, D.Sc., VICE-PRESIDENT, in the Chair.

Dr. Schack-Sommer was elected an Ordinary Member.

Mr. RICHARDSON, of the Botanic Gardens, exhibited a collection of rare plants.

Dr. HICKS read a paper on the Tubularian Hydroids of the District, and was followed by a communication on

FRESH-WATER SPONGES,

By THOS. HIGGIN, F.L.S.

AN unusually fine specimen of one of the two species of fresh-water sponges common in this country having recently

* See page 1.

been deposited in the Liverpool Free Museum, the present is a suitable opportunity for calling attention to it, and for making some observations on the provision which is made for the preservation of the species under circumstances most adverse to the life of the organism.

The two British species of *Spongilla*, are *fluviatilis* and *lacustris*; and the specimen before us is an example of *Spongilla fluviatilis*. It was obtained with some difficulty, I understand, from a pond at Rainhill, by Mr. Charles and Mr. Francis Horace Longuet-Higgins, sons of our valued friend the Rev. H. H. Higgins, and was by them presented to the Museum.

Twenty-one species of fresh-water sponges were known when Dr. Bowerbank wrote his "Monograph of the Spongillidæ," published in the *Proceedings* of the Zoological Society in 1868, and several have been added since. All are at present included in the one genus *Spongilla*, but I believe we are likely to have the accumulated knowledge of the genus which has been acquired since Dr. Bowerbank wrote, contributed by Mr. H. J. Carter, F.R.S., in a communication shortly to appear in the *Annals and Magazine of Natural History*.*

Fresh-water sponges are characterised, as no doubt many of you are aware, by the presence of reproductive seed-like bodies which are visible to the naked eye. They are usually globular in form, and are of a brighter colour than the sponge generally. They are composed of horny material, surrounded by siliceous spicules peculiar to the species. They are filled with the germinating matter of the sponge, which, at the proper time, and under favourable circumstances, issues as a white cottony-looking substance

* Published in *Annals and Magazine of Natural History*, February, 1881. Mr. Carter has made five genera of the now known species, including some new ones recently received from Mr. Potts, of Philadelphia.

through a hilous aperture with which this capsule is provided.

The capsule-spicule is different in each species, but all, I think, may be classed under the two forms, birotulate and linear. The birotulate consists of two wheels or discs united by an axle; that is its typical form, but one wheel is often smaller than the other, less developed, and in some species it is only represented by an inflation at the end of the axle. This spicule is seen, however, in a more abortive form still in other species, and then, not only is one of the wheels not developed at all, but the axle itself is only represented by a pointed prominence in the centre of the disc. Still the gradations are so well marked, from the fully developed spicule, with its two wheels or discs, down to the single disc, with a pointed prominence in its centre, that there is no difficulty in arranging them all under one typical form. The wheels are sometimes ornamented with small boss-like prominences, and sometimes toothed, or having a stellate appearance when an end view only is obtained. The linear spicule is not subject to such variations; it is always linear, but sometimes it is smooth, and sometimes more or less thickly spined. It is generally bent gradually, which fits it better for encircling the capsule.

The birotulate spicules surround the capsule as a columnar structure. The linear spicules, in the species in which they occur, are packed closely together in a layer round the seed-like body.

The seed-like body of *Spongilla fluviatilis* has the birotulate spicule, and an endeavour has been made in one of our diagrams to represent a section of it showing the position of the spicules as they are arranged round it. Our other diagrams represent the spicules of a few other species, some having the birotulate and others the linear capsule spicule, selected to illustrate the changes in the forms of the

birotulate and varieties of the linear. Amongst the latter is conspicuous the capsule spicule of *Spongilla lacustris*, the other British species.

The marine species of sponges are not provided with capsules such as are found in the fresh-water species, which may be due to the fact that they have always plenty of water about them, but it is far otherwise with fresh-water sponges. Their habitat is in lakes, ponds, and rivers, generally attached to sunken pieces of wood, piles, or to the submersed branches of trees growing on the banks, and they are consequently ever subject to premature death and destruction from the receding of the water from about them, without which they, of course, cannot live. The quantity of water in a river, pond, or lake being dependent upon rainfall, the fresh-water sponge is liable to find itself at certain periods of the year far out of reach of its native element; and without some provision for the maintenance of the species, under these circumstances it must quickly become extinct. We are not, therefore, surprised to find provision made for the continuance of the species during these periods of drought. When the sponge-mass becomes exposed to the drying air and hot sunshine, it very quickly perishes; the sarcode is dried up, and the skeleton falls to pieces, but the sponge lives again in the forms developed from the germinating matter contained in the seed-like body. Securely sealed up in the horny capsule, with its siliceous crust, it has completely resisted the drought, and has only waited the return of its native element about it, to issue forth from the aperture, and quickly develop into a sponge-mass in all respects like the parent which has been destroyed. Thus the species is preserved and perpetuated under circumstances most inimical to life.

The existence of these protected germs of life in fresh-water sponges, gives rise to some interesting questions, too large, however, for discussion this evening, such as,—Have

marine sponges been developed from an original fresh-water form, or have fresh-water species originated in a marine form? If the marine species have followed from the fresh-water forms, perhaps the beautiful spicules found in marine sponges, distributed through the sarcode, and called flesh-spicules, may have originally been capsule-spicules, now no longer needed. If, however, fresh-water species have succeeded marine species—if forms originally living in the sea have found their way up rivers—we can hardly imagine any transitional state between the unprotected ovum and that requiring a covering able to resist the effects of drought; from the moment the sponge took up a position from which the water at times receded, it would require the capsule, or the species would be exterminated whenever the river fell below the height at which it was when the sponge developed into a mature form. The argument, so far, seems rather in favour of an original fresh-water species, if indeed both marine and fresh-water species have proceeded from one original stock form, which we are by no means bound to assume.

Professor Huxley, in his admirable and instructive work on the Crayfish, opens his fourth chapter with the following words:—"In the two preceding chapters, the crayfish has been studied from the point of view of the physiologist, who, regarding an animal as a mechanism, endeavours to discover how it does that which it does—and practically this way of looking at the matter is the same as that of the teleologist. For, if all we know concerning the purpose of a mechanism is derived from observation of the manner in which it acts, it is all one whether we say that the properties and the connections of its parts account for its actions, or that its structure is adapted to the performance of those actions.

"Hence it necessarily follows that physiological phenomena can be expressed in the language of teleology. On the

assumption that the preservation of the individual, and the continuance of the species, are the final causes of the organisation of the animal, the existence of that organisation is in a certain sense explained, when it is shown that it is fitted for the attainment of those ends, although, perhaps, the importance of demonstrating the proposition that a thing is fitted to do that which it does is not very great."

In the case before us, marvellous provision has been made for "the continuance of the species," but have we any right to *assume* that "the preservation of the individual, and the continuance of the species," are "the final causes of the organisation" of the fresh-water sponge. It is the *merest* assumption, which we are in no position whatever to prove. In the case of a piece of mechanism—an artificial construction—we know that it had a maker, and that its maker designed and constructed it for a specific purpose; we look beyond the mechanism itself, and it may be permitted to us to look beyond the mere organism, and, in view of the great mystery of life, to be allowed to contemplate the adaptation of means to ends, and of ingenuity of contrivances, as indicating the action of mind from which the conception of the organisation sprang. We are in no way called upon to ignore the idea of a creating mind. And we are in no way bound to follow the learned Professor in his assumption, and limit our conception of cause simply and solely to that of preservation of species.

Leaving, however, the philosophy of the matter, we find that the fresh-water sponge is highly interesting, because its life-history can be studied so satisfactorily, with such ease to ourselves, without hurry, and without interference with our daily occupations. To study marine sponges it is necessary to go and live very near to the sea, where the species we wish to make the object of our observations is known to flourish, for it very soon loses its vitality when removed—even in sea

water under the most careful management—from the place of its growth. But having obtained a piece of fresh-water sponge containing seed-like bodies, we may remove it without any danger to any distance, no great care being necessary, and the extinction of the life of the sponge being of no consequence for our purpose. We take it home, separate the capsules from the dead or dying sarcode, and make temporary ponds of water in which to observe their development. The circumstances being favourable for development, the germinal matter is seen to issue from the aperture, and as the process goes on, by placing our small pond with its contents under the microscope, we observe the skeleton-spicule grow from its commencement in a single cell, the cell gradually diminishing as the spicule increases in size until it is completed. We then find that it is carried about by the general sarcode, and fixed in position by being cemented to other spicules which have arisen in the same way, and that thus the skeleton is built up. Using a higher power, and plunging it into the water, so as to get the sarcode into focus, the flagellate sponge cells, which take up nutriment for the sustenance and growth of the general body, may be seen with the flagella in active operation. The sponge grows and increases in this kind of confinement sufficiently well to enable us in our own studies, and at our own convenience, to observe the whole process of development. We may also develop more than one capsule in the same watch-glass, and thus see the contents of all amalgamate to form one mass, each entirely losing its individuality, and thus obtain a clear conception of how the whole sponge-mass, such as the one we have now before us, has been produced.

The Rev. H. H. HIGGINS then read the following note on a collection of Cirripedes, made by Mr. Charles Darwin, and now in the Free Public Museum:—

“During my visit to London in June, 1880, on Museum

business, an opportunity was afforded me by Mr. Sowerby for the purchase of a large box containing a collection of *Balanidae* and *Lepadidae*. The specimens, which were without names, were wrapped in paper, and did not appear to have been unpacked for a considerable time. They had been in the possession of the late Mr. Taylor, whose conchological museum in the neighbourhood of Norwich is well known to have been very rich. In the course of unpacking the collection in the Liverpool Museum, the extraordinary number of little known forms, and their close agreement with the species described and figured in the monograph on the *Cirripedia* by Mr. Charles Darwin, Ray Society, 1854, convinced me that the collection must have been formed by Mr. Darwin himself. Accordingly, I wrote to him, and, in reply, received through his kindness a letter written by himself, which I now produce. Mr. Darwin states that, after having supplied the British Museum with a full series of all his species, having no further need of his duplicates, he parted with them to the late Mr. Sowerby, of London. Mr. Darwin very kindly expresses himself gratified that the collection should now be where it is appreciated. Evidence is wanting that the late Mr. Sowerby sold the collection to Mr. Taylor, but many similar transactions are known to have passed between them. The specimens are so numerous, and the correspondence so remarkable, that the internal evidence was quite satisfactory to myself before entering upon the enquiry. I have great pleasure in placing this interesting series of specimens before you: they are not considered suitable for constant public exhibition, but may be seen at the Museum by application to Mr. Moore, the curator. Many of the *Balani* are on corals, and might afford materials for the further illustration of Professor Semper's observations on the galls of corals."

The following communication was then read:—

NOTE ON A BRANCH IN THE PEDIGREE OF THE
GENUS *NASSA*, ILLUSTRATING THE AFFINI-
TIES OF FORTY-EIGHT NAMED FORMS WITH
NASSA HIRTA.

By F. P. MARRAT.

These shells are arranged in a diagramatic form, in diverging lines, each line commencing with *Nassa hirta*. The species forming the terminations are among the most distinct forms to be found in this genus, viz., *N. glans*, *N. papillosa*, *N. nitidula*, and *N. tenia*. The gradations, as seen by placing the different allied varieties in a successive series, are so slight that the very close relationship is at once observable, and every conchologist who has seen this drawer, has expressed great surprise at the extraordinary result produced. One of the most prevalent opinions expressed by the more reflective scientists, in examining these shells, is that the varieties appear to be much more distinct forms than others bearing distinctive specific names. The distinctions of genera and species are the work of man; in nature no such hard and fast lines can be found.

Our knowledge of what the ocean contains is very inadequate to enable us to form correct theories from the scanty materials obtained. There is not a single district in any part of the ocean where the use of the dredge has not added something new to our conchological lore, and the immense mass of the ocean bed that remains unexplored ought to teach us to be careful. My own impression is that if I were to follow the usual mode of modern classification and naming, the collection of *Nassa*, contained in twenty drawers in the Liverpool Free Public Museum, would consist of a thousand genera and subgenera, and from three to four thousand species.

SECOND ORDINARY MEETING.

ROYAL INSTITUTION, November 1st, 1880.

THOS. HIGGIN, F.L.S., VICE-PRESIDENT, in the Chair.

Messrs. H. D. Maitland, Francis B. Allen, and John Morrow were elected Ordinary Members.

Mr. NICHOLSON exhibited an Indian helmet, manufactured of Damascus steel, inlaid with gold, and chased with figures of hunters and warriors.

Rev. T. P. KIRKMAN read a short note on Mr. Herbert Spencer's reply to his "Philosophy without Assumptions."

Dr. HAYWARD read a paper on English Spelling.

THIRD ORDINARY MEETING.

ROYAL INSTITUTION, November 15th, 1880.

EDWARD R. RUSSELL, PRESIDENT, in the Chair.

Dr. Pollard and Mr. John Vicars were unanimously elected Ordinary Members.

Dr. NEVINS read the following communication :—

OBSERVATIONS AT THE MELBOURNE OBSERVATORY, OF MARS, JUPITER AND SATURN :—

By ARTHUR E. NEVINS, F.R.A.S.

"The Observatory, Melbourne, Oct. 1st., 1879.

"During the last three months two phenomena have been observed here which are of rare occurrence, viz., the CLOSE APPROACH to each other OF THE PLANETS SATURN AND MARS; which took place on the morning of the 1st of July, at which time they appeared to the naked eye as only one star; and THE OCCULTATION OF A FIXED STAR of the sixth magnitude BY

THE PLANET JUPITER, which occurred on the evening of September 14th; and by the kindness of Mr. Ellery, the Government Astronomer, and Mr. Turner, the Assistant Astronomer, I am enabled to forward by this mail two photographs of the two planets, as seen at this Observatory with the great telescope, at the time of their nearest approach to each other, and also the following description of the phenomena:—These photographs were obtained as follows—Parallel wires were fixed to the eye-glass, with others at right angles, making a set of rectangles, and the position, size, and other features of the object to be photographed were copied with the utmost care upon a sheet of paper marked with similar lines, which can afterwards be photographed on any scale that may be desired.

“THE CONJUNCTION OF THE PLANETS SATURN AND MARS.

“This was observed on the morning of the 1st July, 1879, under very favourable circumstances. The sky was clear, and the atmosphere steady and quiet. The first observations were made about 4 a.m. At this time, Mars was north and west of Saturn, and was moving north and east very rapidly as compared with Saturn, which was moving in the same direction. The first thing that struck the observer was the remarkable contrast in colour presented by them. Mars was of a glaring orange red, with its brilliant white polar bead, which appeared like a bead of glistening silver, while Saturn was of a soft green yellow or greenish cream colour. The diameter of Saturn appeared to be more than twice that of Mars, although it really was not so great, for Mars was not fully illuminated, having the appearance of a moon ten days old; but the illuminated portion was towards Saturn, which facilitated accurate measurement.

“Micrometric measures of the changing positions and distances of the two bodies were commenced at 4.30 a.m.,

and continued till long after the nearest approach. Saturn was moving north-east very slowly, while Mars was travelling fifteen times as fast in the same direction. At about 5h. 8m. a.m., they had reached their nearest approach, and the micrometric measures showed the distance between them to be 87.6 seconds, the bearing of Mars from Saturn being 20° to the west of north. They then separated gradually, and just before sunrise could be seen as two planets with the naked eye.

“The results of this observation indicate slight errors in the tables of Saturn and Mars as adopted by the *Nautical Almanack*, and come nearer to the distances deduced from Le Verrier's tables. Bouvard's tables, which were used in constructing the ephemerides of these planets in the *Nautical Almanack* for 1879, give the distance at 72 seconds, while Le Verrier's furnish 89 seconds. The recorded observations, as already stated, give 87.6 seconds.

“The last close conjunction of these two planets occurred sixty-two years previously, on the 18th of April, 1817, when Mars was south, and 60 seconds distant from Saturn.

“OCULTATION OF THE FIXED STAR—64 AQUARI—BY THE PLANET JUPITER.

“This phenomenon occurred on the evening of the 14th September. The weather was fairly favourable, and the two bodies were in a good position, being from 50° to 60° above the horizon. All Jupiter's moons were visible at the time, and afforded a good opportunity for comparing the appearance of the star with that of Jupiter's satellites. It was rather a remarkable fact that while the star, under favourable circumstances, is visible to the naked eye, and Jupiter's moons are not, yet when seen close beside one of the moons, the star appeared much inferior to it both in brilliancy and size. In fact, with a hand telescope, having a magnifying power of

about 20 to 25, with which Jupiter's moons, as well as his equatorial bands, can be plainly seen, the star could not be seen at all for more than an hour before the occultation took place. The probable explanation of this fact may be that the moons, being always close to the planet, are rendered invisible to the naked eye by the glare of the planet itself, which became the case with the star also when it got near to the planet; and perhaps, if Jupiter's moons could be transferred to a part of the sky where there were no strong lights, they would become visible as stars of a fair degree of brilliancy.

"The appearances at the time of occultation are described as follows by J. Turner, Esq., the Assistant Astronomer, who was at the Melbourne great observatory telescope at the time:—"The space separating the two bodies gradually diminished until it appeared as the faintest line; the contact then took place. The star did not instantly disappear, but seemed to possess a visible disc, the limb of Jupiter seeming to advance gradually upon it, the star appearing to be bisected, and then gradually disappearing altogether.

"The instant of final disappearance was 21h. 40m. 14.5sec. (Melbourne sidereal time), at which time the circle of Jupiter's limb appeared perfect. Previous to this the star appeared as a small protuberance upon the limb, which gradually got smaller and smaller until its final disappearance. The time of first contact was not noted, but I estimated the interval between contact and disappearance at about 36 seconds. For about ten seconds after disappearance the star could be seen through Jupiter's atmosphere as a speck of light seen through ground glass. This also disappeared gradually. At 0h. 7m. 38secs. a clear view was obtained for about five seconds (the sky being by this time cloudy), and a minute protuberance could be clearly seen on the disc of the planet where the star was expected to re-

appear ; this protuberance exactly resembling the disc-like appearance of the star at its disappearance. At Oh. 10m. 43secs. (*i.e.*, about three minutes after the last-mentioned view), I got another view, for about ten seconds, when the star was seen to be well separated from Jupiter.

“ ‘ The computed position of Jupiter was found to be so nearly correct that the occultation took place within four minutes of the predicted time, although Jupiter was moving exceptionally slowly.’ ”

Mr. R. C. JOHNSON, F.R.A.S., then read a paper on “Recent Research into the Movements and Dimensions of the Stellar Universe.*

FOURTH ORDINARY MEETING.

ROYAL INSTITUTION, November 29th, 1880.

EDWARD R. RUSSELL, PRESIDENT, in the Chair.

The Rev. S. Armour, M.A., and Messrs. Sang and Sword were elected Ordinary Members.

Mr. T. J. MOORE exhibited a fine pair of horns of Rhinoceros Keitloa, with other horns, chiefly from South Africa, recently presented to the Free Public Museum by the Rev. R. Wardlaw Thompson.

Mr. JOSIAH MARPLES exhibited and explained a complete set of small dishes, showing the process of *Cloisonné* Enamelling in various stages, from that of the unenamelled dish to the perfect form. As this process is a rigidly guarded secret, a set like the one exhibited is of great rarity.

Mr. YOUNG exhibited a Book of Drawings which had been prepared and engraved under the direction of the late Mr. Wm. Roscoe, for illustrating one of his books.

Dr. WHITTLE read a paper on “Moral Force—its place in Nature.”

* See page 198.

FIFTH ORDINARY MEETING.

ROYAL INSTITUTION, December 18th, 1880.

EDWARD R. RUSSELL, PRESIDENT, in the Chair.

Dr. Whitford was elected an Ordinary Member.

Mr. PICTON read a paper on "Falstaff and his Followers." *

SIXTH ORDINARY MEETING.

ROYAL INSTITUTION, January 10th, 1881.

The Hon. Secretary reported that the Associated Soirée, held on the 22nd ultimo, was attended by 3,250 persons, and that the gross receipts amounted to £448.

The following communication was then read :—

THE RECENT SUBSIDENCE OF LAND IN
NORTHWICH.

By J. W. THOMPSON, B.A.

In the neighbourhood of the town of Northwich, in Cheshire, two different kinds of sinking of land have been going on for many years past. These are *slow* and *sudden* subsidence.

In the first case, the land sinks gradually, and, to a certain extent, evenly over a certain defined area. In the second case, there is a sudden collapse of the surface of the land, a portion of it suddenly disappearing, a hole being formed, the sides of which in a short time fall into the centre, leaving a hollow in the land of an inverted cone shape, which hollow, in process of time, fills with water drained from the adjoining land.

* See page 83.

In the town of Northwich itself, *slow* subsidence alone takes place. In the neighbourhood of the town, both *slow* and *sudden* subsidence.

In order to explain the causes of these two kinds of subsidence, it must first be understood that the salt of commerce is of two kinds—natural rock salt, and manufactured white salt. The former is obtained in a crystallised state by mining; the latter is produced by evaporating in shallow pans, having furnaces beneath them, a solution consisting of salt and water, and technically known by the name of ‘brine.’ This solution is a natural product, and is pumped from wells or shafts sunk in the earth for that purpose.

In and around Northwich, the earth’s crust for an average depth of 110 yards may be considered to be made up from the surface downwards of the following strata :—

- | | |
|-----------------|--|
| | I. Soil. |
| 45 yards thick. | II. Sand, gravel, and marl, with boulders. |
| | III. Indurated clay, grey, red, or blue. |
| | IV. Indurated clay, blue, red, or grey, with patches of gypsum. |
| 25 yds. thick. | V. Rock salt, with more or less of impurities. |
| 10 yds. thick. | VI. Very hard indurated clay, red and blue, with veins of red rock salt. |
| 80 yards thick. | VII. Lower bed of rock salt, the lower five yards of which alone is worked on account of its superior quality. |

“Whenever water comes into contact with either of the beds of rock salt (V and VII), it dissolves and holds in solution a certain amount of this salt. This is the solution which is known as brine. It is therefore very evident that water, constantly washing this rock salt, will quickly eat it away. In this fact lies the whole secret of both *slow* and *sudden* subsidence.

Slow subsidence is caused through the constant washing away of the surface of the upper stratum of rock salt by the water which filters down to it from the surface of the land. As this rock salt is washed away by the water, the brine thus formed flows to the brine pumps, and is taken away. As the surface of the rock wastes, so does the superincumbent earth, marl, and clay follow it downwards, and this continues until the bed of salt is exhausted. Exhaustion can only take place when the whole twenty-five yards is eaten away, and thus, theoretically, the land will ultimately sink, by slow subsidence through that space. Not one-tenth of this distance is at the present time anywhere accomplished.

Up to about ninety years ago, the upper stratum only of rock salt was mined. The purest part of the upper stratum was met with about three yards below the surface, and it extended from six to eight yards still further downwards. A cavity varying in height from eighteen to twenty-four feet was thus formed by mining, with a roof of about nine feet in thickness. This roof, and also the pillars which in mining were left to support the roof, were insufficient to bear the superincumbent weight, and it thus has happened that in almost every case the upper mines have fallen in. The falling in has been hastened or retarded by the presence or absence in the excavation of a supply of fresh water to eat away the pillars.

The lower stratum alone is now worked. The depth from floor to roof is about sixteen feet, and the roof and pillar supports are usually adequate.

Several of both upper and lower mines have become flooded with brine, and have been converted into pumping stations.

The sudden subsidence of land which took place on the 6th December, 1880, occurred in a small district about one mile from Northwich, and known as Dunkirk. It lies between two small brooks, called respectively Wadebrook and

Wincham Brook, which join together in what is called the Mill Pool. Dunkirk is thus surrounded on three sides by the water of these brooks. It is completely undermined by upper and lower mines, several of which have fallen in, and three powerful brine pumping stations have for some years past been at work pumping from the old excavations. An enormous wasting of the rock salt has, in consequence, been going on from year to year.

So soon as the water has eaten away the roof of the upper mine or the pillars, or has made either of them so weak that the support for the earth above is inadequate, *sudden* subsidence takes place. This has occurred in seven or eight instances in Dunkirk. The holes formed by the collapse have at first not been choked by the *débris* from the sides, and the water which has drained into them has leaked through into the old workings. After the water has found its way into the upper excavations, it often finds its way still further downwards into the lower mines, and fills them also.

On the side of Wincham Brook, opposite to Dunkirk, there was in full working order a lower mine, belonging to Messrs. John Thompson & Son, called the Platt's Hill Mine.

Some twenty years ago the excavators in this mine approached too near their boundary on the brook side, and almost broke through into one of the old disused workings on Dunkirk, which had been extended beyond its boundary, and had filled with brine. The wall was found to be so thin, that it became necessary to barricade it with timber, but a constant leakage took place.

On Monday morning, the 6th December, 1880, shortly after six o'clock, as workmen were proceeding to their labour across Dunkirk, a great commotion was observed in a number of the holes referred to, which had filled with water. The water boiled furiously, and was thrown up into the air. Round the edges mud was blown up, and there was a great

noise. A little distance up the Wincham Brook, before its confluence with Wadebrook, it ran through a shallow lagune, about eighty yards across, which had been formed by the slow subsidence. A crack was seen to form across this lagune, into which the water of the brook commenced to run. The running continued for several hours, the crack in the meantime growing larger and larger, until at last the water began to run up the brook, as well as downwards, from a deep lake of about one hundred acres in extent which communicates with the river Weaver. Soon after nine o'clock, it was found that the Platt's Hill Mine was filling, the fractured wall and barricade having doubtless been burst in, and the flow down the aperture in the lagune grew more and more rapid, until the whole of the lagune fell in, and a perfect maelstrom was formed upwards of sixty yards in diameter. The backward flow of water from the large lake increased. The bed of the brook, which before this had had an average depth of three feet only, was ripped up until it was deepened to ten feet and upwards, and the width was increased from nine feet to twenty and thirty feet, and this for a distance of one hundred yards and upwards.

Soon after four o'clock in the afternoon the water ceased to run so rapidly, and the hole began to fill. Platt's Hill Mine was then full. This mine covered an area of between fourteen and fifteen acres, and was worked to a depth of eighteen feet, so that an immense amount of water would be required to fill it.

The brine at the pumping stations, which had previously been four or five yards only in the shafts, rose nearly eighty yards.

It is estimated that three-fourths of a million tons of water flowed down the hole during the day.

[Since the above communication was brought before this Society, a bill has been introduced into Parliament by a com-

bination of property owners in the salt district of Cheshire for compelling compensation from the brine consumers by the levy of a tax upon manufactured salt. This bill has been thrown out in Committee of the House of Commons, the preamble not being proved.]

In the discussion which followed, Mr. THOMAS WARD, who was an eye-witness of the occurrence, gave the following account of what he saw :—

Having been an eye-witness of the great and destructive subsidence of land that took place at Northwich, on December 6, 1880, I will endeavour to explain how and why it occurred. The town and district of Northwich are the great centre of the salt industry of England. Rock salt is found here existing in two distinct beds or layers. The first, or 'Top Rock,' lies on the average about forty yards from the surface, and is twenty-five yards thick. Below this there is a stratum of much indurated clay (locally called stone), of about ten yards in thickness, and then, still lower, the second bed of rock salt, known as 'Bottom Rock.'

From 1670 to 1781 all the mines were worked in the 'Top Rock.' In the latter year the 'Bottom Rock' was discovered, and since that date all the salt mines have been worked in the lower bed. With scarcely an exception all the mines in the 'Top Rock' have fallen in, whilst a number of those in the 'Bottom Rock,' having been worked to the extent of the owners' land, have been abandoned and allowed to run full of brine. This brine, which is nearly a saturated salt solution, is found upon the top of the upper rock salt, or the 'Rock Head,' as it is locally called. Originally, brine was found very plentifully over the whole of the salt districts; but of late, owing to the enormous pumping of brine for the manufacture of white salt, the body of brine has been very much reduced. The old abandoned 'Bottom Rock' salt mines, acting as enormous reservoirs, became filled with

brine, and of late years these mines have been utilised, and the brine pumped out of them. In the normal state of affairs the level of the brine stands some yards above the surface of the 'Top Rock,' and consequently all the cavities, in both the top mines and bottom mines that have been abandoned, are full of brine. In the district of Dunkirk, where the great subsidence took place, there are a large number of old mines, both top and bottom, all of which were not long since full of brine. The continual pumping at three large pumping stations, which supplied the brine for eight or nine separate sets of salt works, gradually lowered the brine, until the old top mines became quite empty, and a considerable portion of the lower mines, extending over nearly fifty acres, were partially pumped out. This was the state of affairs on Monday, December 6. About six o'clock in the morning, owing to a settling of the overlaying earth into one of the old top mines, a rift or crack opened at the surface, across the course of the Wincham Brook. Down this rift the water proceeded rapidly, and made its way to the empty mines below, carrying with it immense masses of earth. The pent-up air in the cavities was expelled with violence, and made its way to the surface through the bottom of a number of pits full of water, which occupied the place of old mines that had fallen in. Through thousands of chinks and crevices the air issued with a hissing noise, and if it came through water it made the pools boil and bubble like huge cauldrons. In some places, meeting with water and clay, it blew the mixture into the air in the shape of liquid mud, forming a series of mud geysers, which played for several hours. From six o'clock to nine the water continued going gently down. In close proximity to the rift across the brook was an extensive mine, worked by Messrs. John Thompson and Son. This mine had been worked close to the old abandoned mines, and on two occasions the

miners had penetrated the barrier. At one of these spots it is evident that the down rushing water had forced a passage into the mine. The opening thus formed must have soon increased, for shortly after nine o'clock more subsidences of land occurred, and the water ran more rapidly down what had now become a kind of funnel. For three or four hours the steady downpour of water continued. Shortly after noon the flow of water increased, and it was evident that for some time, not only all the water of the brook, but a considerable quantity from a large lake of over a hundred acres in extent, as well as from some two miles in length of the river Weaver, had been rushing down into the mines below. From two o'clock till four the scene was terribly grand; the rush of water, which tore up the bottom of the brook and washed down huge masses of earth from the banks, resembled more a mountain torrent in full flood than an ordinary English brook. In spite of the enormous inpour of water from the brook and lake and river, the surface of the water in the funnel got gradually lower. At four o'clock another subsidence took place, and a huge geyser of mud and water burst up from the bottom of an old pool or pit. This subsidence seemed to have choked the funnel, for the water instantly began to rise, and by six o'clock the brook was running placidly into a lake of a funnel shape some seventy-eight feet deep in the middle. The whole of the land in the immediate neighbourhood was shaken, and a chimney, some ninety feet in height, fell shortly before five o'clock, with a terrible crash. An hour or two afterwards several more subsidences took place, and four days afterwards a hole fell in, some forty or fifty feet in diameter and as many deep, taking in a road which had been traversed by thousands during the preceding days. The first, or Monday's, sinking, broke the brine pipes conveying brine to the salt works, and completely stopped five sets of works.

The brine, which prior to the subsidence had stood more than one hundred yards from the surface, rose to thirty yards, and all the mines, both top and bottom, were filled. The mischief was increased and intensified by the filling of Messrs. Thompson and Son's Platt's Hill Mine, which extended over an area of about fifteen acres, having an average worked-out depth of fully fifteen feet.

It is extremely probable that when the brine is again pumped out of all the pits, as it will be in a short time, there will either be a number of small subsidences or another large one similar to that of December last.

Mr. J. LINTON PALMER, Staff-Surgeon, R.N., exhibited a whiting, which appeared to have been choked while swallowing a sprat, found on the Cheshire side of the Mersey.

Mr. WALTHER exhibited a specimen of fungus which was found growing on the fracture of a cracked wine bottle, and had thus prevented the escape of the liquor.

The Rev. Dr. STERN then read a paper on "The Talmud." *

SEVENTH ORDINARY MEETING.

ROYAL INSTITUTION, January 24th, 1881.

THOMAS HIGGIN, F.L.S., VICE-PRESIDENT, in the Chair.

Mr. T. J. MOORE read, from a letter lately received, the following

NOTE ON THE MODE OF FEEDING OF A BRAZILIAN MANTIS.

By E. DUKINFELD JONES, C.E., CORRESPONDING MEMBER,
SAO PAULO, BRAZIL.

"I have a tame Praying Mantis in the larva stage. He is a strange object. His face is a triangle, and is fixed at the

* See page 49.

end of a long neck by a ball and socket joint, I believe, for he apparently can twist it round into any position he chooses. I feed him on flies, which he devours between his paws like a dog gnawing a bone. He has eaten one to-day, and I have just put another into his den. He has seized him twice, but the fly got away again. He is not quite large enough yet to hold a house-fly if it struggles much. I must try to get something smaller for him till he is able to tackle larger game. I hope, by and by, he will be big enough to hunt blue-bottles. It is most amusing to watch him when the fly runs against him by mistake. He starts as if he had seen a ghost, and says, 'Whatever was that?' Then he puts himself in his pouncing attitude, and says, 'If you do that again I'll go for you.' He is a droll animal, and much resembles a monkey. I have a worse one now, and he has eaten the other one. I found him in my bedroom when I went to bed last night. He is a large fellow, and his greed has no end. Besides eating his brother and a fly last night, he has to-day devoured two flies, a beetle, and a queen-ant, and is ready for more. He is in the pupa stage, and will, if he lives, be a fine insect when he arrives at maturity. I should like to see two of equal size tackle each other. It would be a case of Kilkenny cats, I suppose, for they begin eating their prey as soon as ever they catch it, and do not waste any time in killing it.

"P.S.—The Mantis is now eating a moth that was flying round the lamp. It has thus devoured insects of four orders to-day—Hymenoptera, Diptera, Coleoptera, and Lepidoptera, and yesterday Orthoptera also."

The Rev. H. H. HIGGINS exhibited and made some observations upon a mounted specimen of *Cestum Veneris*, received with several other rare Mediterranean invertebrata preserved in spirit, from Dr. Anton Dohrn, Director of the Marine Zoological Station, Naples. Mr. Higgins' also pre-

sented figures and description of a new Shell of the Genus *Marginella*, by Mr. F. P. Marrat.*

Mr. STEEL then read a paper on "The Philosophy of the Probable." †

EIGHTH ORDINARY MEETING.

ROYAL INSTITUTION, February 7th, 1881.

EDWARD R. RUSSELL, PRESIDENT, in the Chair.

Messrs. Lovell and Cornelius were elected Ordinary Members.

Dr. CARTER exhibited a cylindrical glass jar, smoked on its interior surface, in which he had grown some wheat, in hopes that the growing apex might register its movement on the glass. Mr. Darwin's book on the "Movements of Plants" supplied many interesting experiments on the customs of radicals, &c. Dr. Carter wished to see if the entire shutting out of light was followed by any movement other than an ascending one of the growing point. Most of the plants grew vertically, and did not register their growth; one, however, touched the side by its point, and the line of growth was then indicated, after several weeks, by a series of vertical dots where the point had touched the surface and rubbed off the lamp black.

Mr. GUTHRIE read a paper on "Spencer's Physical System as applied to Biology," of which the following is a synopsis:—

PART I.—Reply to Mr. Spencer. General estimate of the effect and value of Mr. Spencer's work.

PART II.—The Primary Facts:—The Indestructibility of Matter; the Continuity of Motion; the Resistance of Force on the Ultimate Absolute, the final meeting place of all philosophers.

PART III.—The Actual Process examined in order to ascertain the ruling and actual principle of physical change. The Constituents

* See page 76.

† See page 110.

of the Nebulæ—the Concomitancy of the Concentration of Matter, and the Dissipation of Motion disputed. Is the universal process limited or unlimited? Equilibration the ruling cause of change. Equilibrium prevents change. The “Continuity of Motions” disputed.

PART IV.—Feeling and Consciousness excluded as Factors in Organisms—the Double Aspect Theory.

PART V.—The Biological explanations. Organic Matter. Growth. Development. Function, Waste, and Repair. Adaptation. The Definition of Life. The Theory of “the Moving Equilibrium;”—Its application to Life disputed. Genesis unexplainable. On Indirect Equilibration—it is not Equilibration at all. On the need for the Continuation of Species. Conclusion.

NINTH ORDINARY MEETING.

ROYAL INSTITUTION, February 21st, 1881.

EDWARD R. RUSSELL, PRESIDENT, in the Chair.

Mr. T. J. MOORE exhibited, from the Free Public Museum, the following mammalian skulls, mounted for purposes of study, by his son, Mr. Thomas Francis Moore, viz. :—

The disarticulated skull of a young African Elephant, from a specimen presented by Mr. William Cross.

The disarticulated skull of a Dugong, from Singapore, presented by Surgeon-Major Samuel Archer, Corresponding Member.

And the disarticulated skull of a Manatee, from Honduras, from a specimen also presented by Surgeon-Major S. Archer.

Also, the skeleton of a Common Chick, at the sixteenth day of incubation, prepared and presented by Dr. J. Sibley Hicks.

Mr. T. J. MOORE also announced the recent arrival, and presentation to the Free Public Museum, of a collection illustrating the Metamorphoses of the Lepidoptera of Sao Paulo, Brazil, with notes and drawings, by E. Dukinfield Jones,

C.E., Corresponding Member of the Society, who had been assiduously working for some years past, as reported from time to time to the Society, and as recorded in its Proceedings, vol. xxxiv. (1879-80), p. lxiv.

The present series of specimens, illustrating about eighty species, does not profess to include more than the full-fed larva, the pupa, and the imago; but Mr. Jones hopes that, when time permits, he may be able to work out the changes from the egg to the perfect insect.

The specimens were exhibited almost as they were received; the *larvæ* in spirit; the *pupæ* in boxes; and the perfect insects in paper; accompanied by over eighty sheets of foolscap manuscript, each sheet being devoted to a separate series, and containing Mr. Jones's notes on its metamorphoses, as carefully observed by himself.

The Rev. H. H. HIGGINS complimented the Society upon having such an enthusiastic entomologist among its Corresponding members, and Mr. Dukinfield Jones upon the success of his labours, and the admirably systematic manner with which they had been conducted. The collection had arrived so recently that it had been impossible to unpack the specimens. This would require considerable time and care, and when this and other necessary work, such as damping, setting, and naming the specimens was accomplished, he hoped to bring the collection again before the society.

Dr. HICKS exhibited specimens of the Common Chick, while still in embryo, at the fourth, sixth, ninth, and eleventh days of incubation.

Dr. NEVINS read a paper "On the Translation in the Authorised Version of the New Testament of the Compounds and Derivatives of *Κρίνω* (*krino*); and especially of *κατα-κρίνω* (*kata-krino*), and *ὑπο-κρίτης* (*hypocrites*)."

* See page 135.

TENTH ORDINARY MEETING.

ROYAL INSTITUTION, March 7th, 1881.

EDWARD R. RUSSELL, PRESIDENT, in the Chair.

Mr. Leonard O. Hess was elected an Ordinary Member.

The following communication was then made :—

**NOTES ON THE PECULIAR DEVELOPMENT OF
AN EGG OF THE COMMON FOWL.**

By J. SIBLEY HICKS, F.R.C.S.

I bring before you this evening a rather curious phenomenon. It is a tolerably large egg of the common fowl, within which was found a completely formed egg, with a well-developed and hard calcareous shell.

The ovary of the common fowl consists of numbers of follicles, loosely held together by areolar tissue ; within these follicles the eggs may be seen at all stages of development.

As the egg becomes matured and ready to leave the ovary, it increases in bulk, distending, and finally rupturing the wall of its follicle. The egg is then discharged through the ruptured opening, and is at once received into the inner orifice of the oviduct, from whence it at once commences its downward descent to the external orifice. When the egg of the fowl leaves the ovary, it consists of a globular yolk, which is enclosed in a thin and transparent yolk membrane. In this condition it is grasped by the funnel-shaped opening of the oviduct.

The muscular coat of the oviduct is highly developed, and the egg is urged forwards by the peristaltic action of this coat, precisely as the food passes down the gullet after it has reached the back of the throat. The oviduct is about eighteen inches in length, and for convenience of description may be divided into four parts.

The first part is from two to three inches in length, with a smooth and transparent mucous membrane. In this division the yolk absorbs a fluid consisting of thin mucous, and is thus rendered more flexible and yielding in its consistence.

The second division is about nine inches in length, and the mucous membrane is here thick and studded with numerous glands. In the upper part of this division the membrane secretes a viscid material, which surrounds the yolk and becomes consolidated into a loose membranous deposit. As the egg descends, the contraction of this part of the duct is such as to give to it a rotary as well as forward movement.

As a consequence of this motion, the two extremities of the membranous deposit become twisted in opposite directions into two cords, which run from opposite poles of the egg. These cords are termed the chalaza. The remaining part of this division secretes an abundant gelatinous albuminoid substance, which is deposited in a succession of layers round the egg. This layer is the well-known white of egg, and it is deposited in greater abundance in front of the advancing egg. The third division of the oviduct is about three and a half inches in length, and secretes a material which condenses into a firm fibrous covering, which closely embraces the white of the egg. This covering is composed of three layers: an external, a middle, and an internal fibrous layer. The fourth division is about two inches long, and very much wider than the rest of the oviduct. The mucous membrane of this division excretes a fluid, which is saturated with calcareous salts, and as this fluid comes into contact with the external fibrous membrane, it insinuates itself among the delicate fibres of this layer, and soon begins to crystalise, until it finally results in the thick calcareous deposit familiar to us as the egg-shell.

This very brief description of the passage of an egg down

the oviduct will show the difficulties encountered by the lesser egg in finding its way into the greater.

The lesser egg could not possibly have received its shell until it had arrived at the fourth part of the oviduct; and it could not possibly have been embraced by the fibrous layers of the greater egg unless it had joined the greater egg previous to its entering the third division.

The only explanation seems to be that a retrograde movement took place. The usual peristaltic action of the muscular coat of the lower half of the oviduct must have been reversed, and the newly-shelled egg, driven backwards into the second part of the oviduct when it met with the descending egg, became embedded in its albumen, and finally enveloped by the fibrous layers and calcareous shell.

Mr. NEWTON, M R.C.S., read a paper on English Caricature Art, which was illustrated by a considerable number of satirical drawings by Rowlandson, Gilroy, Cruikshank, and others, depicting social manners and political occurrences during the eighteenth century.

ELEVENTH ORDINARY MEETING.

ROYAL INSTITUTION, March 28th, 1881.

EDWARD R. RUSSELL, PRESIDENT, in the Chair.

Mr. J. A. PICTON, F.S.A., called attention to the habits of Ants, and related how that, when his greenhouse was infested with them, they all suddenly disappeared, as if by common agreement, after several had been caught in a plate of sugared water.

Messrs. MARPLES, ROBERTS, CARTER, and HIGGINS related observations of a similar kind, and Dr. CARTER pointed to the facts narrated, to show the caution that should be used

in generalising about the want of the reasoning faculty in creatures which had not an approximation to the nervous structure of the higher animals.

Mr. ALBERT J. MOTT, F.G.S., read a paper called "Notes on Easter Island." *

TWELFTH ORDINARY MEETING.

ROYAL INSTITUTION, April 4th, 1881.

EDWARD R. RUSSELL, PRESIDENT, in the Chair.

The PRESIDENT referred to the death of Mr. David Marples, who had been a member of the Society for eighteen years, had contributed some valuable papers to its volumes of proceedings, and had been printer to the Society since 1864.

Mr. ROBERT F. GREEN read a paper on "Oliver Wendell Holmes—his Writings and Philosophy." †

THIRTEENTH ORDINARY MEETING.

ROYAL INSTITUTION, April 18th, 1881.

EDWARD R. RUSSELL, PRESIDENT, in the Chair.

Mr. Edward Davies, F.C.S., was unanimously elected President for the next two sessions.

Dr. CARTER read notes on the effects of variation in atmospheric pressure on the germination of seeds. Experimenting with mustard seeds, he always found that when submitted to two-and-a-half atmospheres of pressure, their germination was much more rapid than that of seeds under ordinary atmospheric pressure (the other conditions affecting

* See page 159.

† See page 215.

the two sets of seeds being exactly the same), but that subsequent growth was markedly retarded.

The Rev. H. H. HIGGINS, M.A., read a short paper on "Protective Appliances in the Anarthropoda." The paper was illustrated with a series of coloured drawings.

Mr. T. J. MOORE submitted the following communications :—

Report on a Collection of Polyzoa, from Bass's Straits, presented to the Liverpool Free Museum by Capt. W. H. Cawne Warren, Corresponding Member of the Society; by the Rev. T. Hincks, F.R.S. *

Supplementary Report on Foraminifera and Sponges, from the Gulf of Manaar and Bass's Straits, &c., presented to the Liverpool Free Museum by Capt. W. H. Cawne Warren, Corresponding Member; by H. J. Carter, F.R.S.†

Dr. SHEARER read a Paper, of which the following is an abstract, on the question :—

IS THE USE OF OPIUM BENEFICIAL OR OTHERWISE TO ORIENTALS?

THE answer to the above question is embodied in the following propositions, the result of a good many years' practice amongst the Chinese, and an extended inquiry into the subject. It would seem to be essential that the question above stated should be definitively settled before entering on a crusade for the suppression of the opium traffic. That such an inquiry is not out of place may be gathered from the fact that the Marquis of Hartington, in the debate last year on the opium trade with China, stated that he held it *not proved* "that opium is really so demoralising, not merely in its abuse, but also in its use, as to lead us to assist in the prohibition of the trade." And again, Mr. Gladstone affirmed

* See page 249.

† See page 271.

“that if we are to denounce the use of opium as something which is universally, essentially, and irretrievably bad, that must be done after it has been proved that the use of opium is to be broadly distinguished from the use of every other stimulant; a point which is not settled yet.”

1st. *It is stimulant, intoxicant, and narcotic*, according to the dose, and is commonly employed by the Chinese for these effects. In these respects it is very much more deleterious than alcohol, inasmuch as it materially interferes with the nutritive bodily processes, inducing *ultimately* in all cases, and in many a *sudden* arrest or catalepsy of nutrition. Moreover, whereas alcohol undergoes partial oxidation within the system, and so generates force of some kind, opium yields nothing capable of conversion into tissue or of sustaining the animal heat. *Ex nihilo nihil fit*. In a great many cases it induces the desire for, or goes along with, the use of other narcotics, such as the hydrate of chloral and the stronger intoxicants—brandy and whiskey.

2nd. *The primary excitant or inebriant effects* are followed by *depression or recoil* proportionate to the dose taken, —De Quincey's statement to the contrary notwithstanding. This state of depression takes the form of restlessness, irritability, prostration of strength, deep despondency—even despair.

3rd. The effects are practically similar, whether smoked, swallowed, or hypodermically injected. Chinese opium is less potent than the Indian drug, and *smoking* opium is probably a less deleterious habit than opium-eating, inasmuch as certain of the narcotic principles (morphine, narcotine, etc.) are only to a certain extent vaporisable by the heat of the opium-pipe. In proof of this, I may say that the ash from the opium-pipe is intensely poisonous, and is carefully saved, mixed up with some fresh extract to give it flavour, and sold again to the lowest class of opium smokers.

4th. *Increasing doses* are demanded to keep up the original effects (De Quincey notwithstanding). As a jaded horse requires more of the whip and spur, so more and more of nervous tissue being *thrown out of gear* by the use of the drug, the blood must be saturated to a higher and higher degree with the poison, so as to ensure extensive contact with the nervous matter, if the debauchee is to enjoy the narcotic indulgence in which he delights.

"Opium incites the moderate-smoker to constant increase."—*N—C—, Chinese Merchant.*

"Moderate opium smoking lasts only for a time; they all go steadily on to that stage which is self-destructive."—*Sir Rutherford Alcock.*

5th. It does not intercept the development of pulmonary consumption (De Quincey maintained that it did); though medicinally, in calmative doses, it is of the highest value as an adjuvant in the treatment of that disease.

6th. It relieves aguish attacks, but in no way prevents their recurrence. It is, therefore, not a prophylactic against intermittent fever, and does not fortify the system against malaria, though ignorantly believed by the Chinese to have such power.

7th. The practice injures the health and shortens life. Oppenheim says, "Opium smokers seldom attain the age of forty"; Gauld, that "they become old men in their prime." No assurance society in Great Britain will accept the life of an opium-smoker or opium-eater.

8th. It induces impotence and interferes with population. Impotence and sterility are undoubted results.

9th. It involves a ruinous waste of time in waiting upon the craving, in ministering to it, and sleeping off its effects; so that altogether, apart from the immediate expense (which is great), it is a most impoverishing habit.

In a commercial point of view, the purchasing power of

the nation must be immensely reduced, from the fact that the whole of their most precious commodities—tea and silk,—to the amount of 50 or 60 millions of taels per annum (say twenty millions sterling) is bartered for opium.

10th. It has been shown on a large scale to sap the courage and undermine the vigour of whole bodies of men. "The Canton troops in 1832," says Sir John Davies, "were defeated by the Mountaineers on the Borders, and, in fact, proved utterly worthless *from the general use of opium*; 200 men out of 1,000 having been rendered quite unfit for active service."

11th. Perhaps the most deplorable feature of opium-smoking is this, that the *victims have rarely, if ever, any proper desire to shake off the habit*. Hundreds indeed come to the hospitals, yet not one in a hundred, no matter whether heavy smokers or light, with any genuine desire to renounce the practice, but simply because of temporary inability to purchase the drug—for something to stop the opium crave. Hence the painful probability, amounting almost to a certainty, that when times improved with them, the greater number would again resort to the pipe, rendered "tenfold dearer by the power of intermitted custom." Says S. T. Maunders: "The cure of opium-smokers is becoming a less and less hopeful task with medical men;" and Sir Thomas Wade: "*I know no instance of radical cure.*"

12th. The late Dr. Anstie contended that the drug is often employed at home in trifling quantities, not as the means of a luxurious debauch, *but as a soothing stimulant*, which he mistakenly calls a "*food-stimulant effect*," to remove the traces of fatigue and depression, and undoubtedly it is so used by vast numbers of Orientals *for a time*, in like moderation and for the sake of the temporary solace and invigoration which it brings.

These myriads of opium-smokers may not contemplate,

nor remotely desire, *narcotic indulgence*, but they are infallibly on the way to it, and to the binding of themselves under a yoke which they may groan under, but which they will never seek to renounce. The power of opium "to recreate the travelled spirit," as some one says of tobacco, is fatally overshadowed by the *fascination* attaching to it, and in respect of which, it transcends every other luxury. "There is no slavery on earth," says an eye-witness of the custom of opium-smoking in Batavia, "to be compared with the bondage into which opium casts its victims." All that is deemed most precious is sacrificed to meet the rampant and agonising clamours of a constitutional craving—the sanctities of home, the love of relations, truthfulness, and health, and a good name, and the means of living. Once embarked on the habit, it proves a *sliding scale*, which in this world has no termination but in a beggarly and dishonoured grave.

No debate on the food-stimulant properties of opium can be held. It is simply a powerful drug, having inebriant and narcotic properties, useful in times of great physical distress; but pernicious beyond belief when employed as a luxury and an indulgence, and when once it fastens itself upon the constitution as a daily necessity.

Well might Sir Benjamin Brodie and the greatest medical authorities of his day, say, "I cannot but regard those who promote the use of opium, as an article of luxury, as inflicting a *most serious injury on the human race*," and the Court of Directors of the East India Company in a momentary spasm of contrition put on record their famous minute: "Were it possible to prevent the use of the drug altogether, except as a medicine, *we would gladly do it out of compassion for mankind.*"



MARGINELLA [Cryptospira] ovalis, Marrat.

CHARD, Delt.

MARGINELLA (Cryptospira) ovalis, MARRAT,
Swatow, China.

The above shell has just been sent home from
Singapore, by Surgeon-Major S. ARCHER,
to his brother, Mr. F. ARCHER, of Liverpool.

Shell broadly ovate, of a pale straw colour, very
obscurely banded, with a broad thickened margin of
an orange colour; spire concealed and replaced by
a thickened callous; columella with six strong folds,
the upper one much elongated and fading on the
front; the folds are each slightly grooved down the
middle; outer lip flattened and receding, inside
smooth; callous near the upper edge, at its junction
with the spire, much swollen; near the base broad
and orange coloured.

This is allied to the *M. labiata*, Valenc; *M.*
quinqueplicata, Lam.; *M. lilacina*, Sow.; and may
prove to be only a variety of all or any of them.

F. P. MARRAT,

Scientific Staff, Free Public Museum, Liverpool.

N.B.—The new *EULIMA candida*, Marrat, is from the
same locality.

Jan. 18, 1881.

PAPERS READ.

THE INDEPENDENT PREROGATIVE OF THE UNDERSTANDING IN THE DOMAIN OF MORAL JUDGMENT.

By EDWARD R. RUSSELL, PRESIDENT.

THE subject upon which I offer to-day some reflections which have been suggested to me by certain incidents of the year, has a theological bearing, and may therefore seem to require an apology on its introduction. It will, however, be treated by me without the smallest encroachment upon—without any discussion of—theological dogma. As it belongs to the most practical moral philosophy, we are entitled to consider it. The most that can be demanded of us, in the way of reticence or in the choice of our arguments, is, that while we make pure reason our guide we should avoid anything like reflections upon current religious beliefs. To this canon I shall be not only willing but eager to conform. The opinion which I mainly desire to express is held by many, may be held by all, and is certainly cherished by myself, without any failure of assent to the received doctrines of Faith. If what I propose to say needs to be said, it is better that it should be said by one who is able to make this avowal, than by any person whose protest in favour of the independence of moral judgment—for that is my theme—might be attributed to the promptings or predilections of heterodoxy.

A year ago I should probably have regarded any such protest as scarcely necessary. I knew indeed then that on the lower levels of moral life and education the doctrine of immortality and the pains and penalties of the future, as well as the sublime paternal and filial relations between the

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Creator and his creatures, of which theology teaches, were supposed to be not only—as they are in fact—the most valuable and moving influences in favour of morality, but the sole and essential supports of moral obligation. But I should not have supposed that this theory, which I deem to be dishonouring alike to the Deity, to religion and to the moral judgment of man, would be countenanced by high authority. A remarkable address delivered by M. Renan in London last March, and writings which followed it, have led me to believe that the view which I have censured is held with great seriousness by more important persons than I should have dared to tax with it. Even now I am almost in doubt whether the argument I shall address to you will not be deemed trite if I appeal successfully to the candour of my hearers; but I have a theory of the utility of Societies such as ours which encourages me to lay that argument or statement before you. We are called a learned Society, and we have had and have many members whose attainments, whose pursuits, and whose contributions to our proceedings justify to a certain extent the appellation. But we cannot disguise from ourselves that we are for the most part men of business and affairs, whose time and energies are largely occupied by engrossing avocations; whose enquiries into philosophy must be but cursory; whose acquisitions are likely to be comparatively shallow; whose life is in the main the life of other Liverpool men. I should think it would be an affectation on the part of the majority of us to consider ourselves entirely segregated from the superstitions and prejudices of other fairly educated English people. We probably occupy a middle position between those who neglect and those who efficiently cultivate philosophy. At any rate, that is the modest place which your present President is content to occupy. His desire at this moment is to induce persons of average cultivation to divest their minds of a religious pre-

judice and a confusion of thought which even average cultivation should forbid. If in the endeavour he should shock the piety of some, or if to others he should seem to be needlessly insisting on an intellectual enfranchisement which is recognised as a natural and unquestionable right, let it be remembered that in the medium tenor of the path he has chosen he is likely to appear audacious to those who keep the beaten way—timid to those who are accustomed to the devious and rugged tracks of adventurous thought. It is fit work for this Society to induce all who come within its range to regulate their judgments by reason, whatever other excellent influences may assist them in conduct; and no mood of mind should be alien from us or is beneath our notice in which we are liable to find either a considerable number of ourselves or many persons of our own standing and associations whom we know in society.

My immediate predecessor, for whom we cherish equal admiration and affection, made it his business in his first Presidential Address to assert most uncompromisingly the absolute claim of ascertained physical science on human belief. In a reflex sense the remarkable argument which Dr. Drysdale addressed to us in support of this thesis, had a much more distinct and more awkward theological bearing than that in which I am about to engage. This is not the occasion for criticism of the late President's first address. Ample opportunity was given at the time, and it was urged by some of us that the claims of reason which Dr. Drysdale so finely vindicated in the region of physical demonstration needed to be asserted simultaneously in the domain of historical criticism, in order that intellect might work out for itself a platform of theological belief, level with and capable of being fitted to the very positive platform of physical dogma which science appeared to

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have established. However this might be, it was on all hands conceded upon that occasion that, so far as human responsibility extended, physical facts and past physical processes must be held to be and to have been what human intelligence was by induction convinced that they were and had been. In fact, Dr. Drysdale's address was a plea for the right of the human mind to be satisfied on the merits in the region of physical science, as Luther's plea for private judgment asserted the claim of the human mind to be satisfied on the merits in the department of scriptural interpretation. So now I urge the right of the human mind to be satisfied on the merits in the sphere of morals.

In this undertaking I shall be neither technical, transcendental, nor ambitious. I shall avoid all controversial matter as to the growth of moral sensibility. I shall say nothing of the tribal conscience, nothing of many other things which are familiar in the disquisitions of modern philosophers. All discussions of the ultimate standards of ethics are foreign to my purpose. It matters nothing whether the greatest good of the greatest number, or the innate and self-evident beauty of virtue, be your test. You may even, if you please, draw into your judgment, as one element of any particular case, the inductively ascertained value of any particular form of religion, and the authority which that form of religion may thus have acquired, to be at least heard on points of morality which seem to require its sanction, or which at any rate are not especially well supported by abstract or practical considerations. Whatever standard is preferred, whatever reasoning is taken into account, it is enough that the human mind in forming each moral conviction has and exercises a *quasi* independent moral judgment. That judgment is certain to be quite adequately affected by hereditary prepossessions, which will

usually coincide with the teachings of the prevailing religion, or, at least, will have accrued from processes in which the religion which has dominated over men's more recent ancestry will have been an active factor. One of the first and most obvious duties of every man who intelligently regards and cultivates his moral sense must be to take into account everything that can legitimately affect, either by reason or sentiment, his moral bias. But when everything germane to moral judgment has been absorbed into the mental being by heredity and education, or assimilated by thought, the independent function of passing a moral judgment remains the essential prerogative of every human being; and any authority which, otherwise than by satisfying the mind on the merits, proposes to dictate a moral conclusion, usurps a dominion which cannot be exercised without danger at once to the moral fibre of the individual and to the purity of the general code.

We shall find ourselves in the midst of our subject if we turn to M. Renan's discourse upon Marcus Aurelius Antoninus. The great Stoic Emperor is one of the best understood as well as one of the most admired characters in history. In his *Thoughts*, pronounced by Dr. Farrar the purest and noblest book of antiquity, Marcus Aurelius has told us exactly what he wished and manifestly strove to be, and there is abundant proof that he to a great extent succeeded in his lifelong enterprise of self-culture. To readers in these later ages, when the whole conception of morals has been imbued with the traditions and ideas of Christianity, the *Thoughts* of the good Emperor must of necessity present the problem how far our religion is the essential and indispensable vehicle of pure morality; and there can be no reason why this subject should not be investigated with philosophical exactitude and calmness. My own conviction is clear

that the incidence of morals—what Pope, in writing to Bolingbroke, called “the right sense of things as we stand related to each other by the laws of God and indebted to each other in conforming to those laws”—is quite independent of all dogmatic religion, began with the earliest rudiments of gregarious or even intelligently conscious human life, and must remain co-existent with society as long as men live together. This conviction does not derogate from the greatness and value of the additions made, even to Marcus Aurelius’s very noble scheme of ethics, by the teachings and examples of Christianity. Yet it is well that we should candidly appreciate all that was really good under the old Pagan *régime*, for it is as really superstition to attribute to a true religion an undue influence of change and improvement as to worship stocks and stones at the bidding of a false religion.

There is an eloquent passage in Dean Merivale’s “Romans under the Empire” which very powerfully deprecates all delusion on this point. “It seems a duty,” says Dr. Merivale, “to protest against the common tendency of Christian moralists to dwell only on the dark side of Pagan society, in order to heighten by contrast the blessings of the Gospel. Much candour and discrimination are required in comparing the sins of one age with those of another. The cruelty of our inquisitions and sectarian persecutions, of our laws against sorcery, our serfdom and our slavery, the petty speculation we tolerate in almost every class and calling of the community; the bold front worn by our open sensuality; the deeper degradation of that which is concealed; all these leave us little room for boasting of our modern discipline, and must deter the thoughtful inquirer from too confidently contrasting the morals of the old world and the new. Even at Rome, in the worst of times, all the relations of life were adorned in turn with bright instances of devotion, and man-

kind transacted their business with an ordinary confidence in the force of conscience and right reason. The steady development of enlightened legal principles conclusively proves the general dependence upon laws as a guide and corrector of manners. In the camp, however, more especially as the chief sphere of this purifying activity, the great qualities of the Roman character continued to be plainly manifested. The history of the Cæsars presents to us a constant succession of brave, patient, resolute and faithful soldiers, men deeply impressed with a sense of duty, superior to vanity, despisers of boasting, content to toil in obscurity, and shed their blood at the frontiers of the empire; unrepining at the cold mistrust of their masters, not clamorous for the honours so sparingly awarded to them, but satisfied in the daily work of their hands, and full of faith in the national destiny which they were daily accomplishing." This is a picture which we may well contemplate before pronouncing rashly in an unctuous tone any exaggerated eulogium on the comparative virtue of Christian and pagan moral systems. And when we study Marcus Aurelius, though we miss some of that emotion with which in our religion morality is suffused, our admiration for the purity and depth of his morality may well inspire in us some sympathy with the Roman cardinal who dedicated his translation of the Emperor's "Thoughts" to his own soul, to make it redder than his purple at the sight of this Gentile's virtues.

M. Renan is not wanting in admiration for the great qualities of Marcus Aurelius, but his monograph disappoints in two directions those who are most likely to read it with expectation of advantage. He tests some truth by the merest sentimentality. On the other hand, he reduces actual morals to a principle of mere self-interest in which there is no sentiment whatever. These errors seem inconsistent and hardly possible to have sprung from the same mind, but they are

found most conspicuously side by side in M. Renan's argument. He begins by a most discerning account of the supreme merit of the great Emperor's moral thinking. "Disengaged from any bond of system, it rises to a singular loftiness—higher even than that of the author of the 'Imitation of Christ,' who, though much detached from the quarrels of the schools, was essentially Christian in his manner of feeling. Take away the Christian dogmas, and that book retains only a part of its charm. The book of Marcus Aurelius, having no dogmatic basis, will retain its freshness eternally. All, from the atheist or the man who believes himself to be an atheist, to him who is most attached to the particular beliefs of any cult, may find in it points for edification. It is the most purely human book there is. It trenches upon no controverted question. In theology, Marcus Aurelius floats between pure deism, polytheism in a physical sense interpreted after the fashion of the Stoics, and a sort of cosmic pantheism. He does not hold much more with one of these hypotheses than with another, and uses indifferently the three vocabularies, deistic, polytheistic and pantheistic." This is a true description. It is an eulogistic description. Considering the point of time at which Marcus Aurelius appeared, the encomium is a high one. But the morality of Marcus Aurelius is a very simple phenomenon, and its beauty and abiding value lie largely in its simplicity. I cannot understand, therefore, why M. Renan immediately afterwards wanders into subtleties. Marcus Aurelius was what he was and thought what he thought because he held firmly to the morals of common sense, to the code of duty as understood in his time by the best intelligences, and to the moral sympathies which animated in his time the best hearts. I know of no other rule of sound moral sentience than this. There is no occasion to wonder why so good and clear-headed a man followed it; and M. Renan has surely

rather darkened counsel than elucidated any ethical question, has done injustice also to the common characteristics of humanity, and has given undesirable sanction to very low views of moral obligation, in attempting to qualify by theological requisitions the high praise which Marcus Aurelius has received from him.

Most unfortunate is the degradation of tone when M. Renan descends from the serene height of moral certainty upon which the thoughts of Marcus Aurelius expatiate to the petty plane of theological calculation. Instead of recognising with admiration that Marcus Aurelius used his vague ideas of the gods for the strengthening and sanctioning of his clear ideas about duty, just as Christians find motives and helps for duty in the sacred incidents of their faith, M. Renan places the Emperor's religion in the light of mere convenient "hedging," so as to be on the right side, whatever might turn out to be true; and not only so—he charges upon us all the like paltering with theological dogma. The thoughts of Marcus Aurelius, he tells us, "have two faces according as God and the soul are or are not really existent." I can find in Marcus Aurelius no symptom whatever of dual or alternative views on any moral subject. Nor does M. Renan intend to impute this. He knows that the opinions of the good Emperor were formed on the moral merits of each moral issue, and were not liable to be affected by supernatural hypotheses. What he means is that Marcus Aurelius aimed at protecting himself against the blame and the punishment of profanity, on the supposition that God and the soul were real, by bringing some mention of them into his arguments, though his arguments were quite independent of theological support.

And this is, it seems, what we all do—"we" standing, it may be presumed, for all sorts of *illuminati*. "It is the reasoning we adopt every day, for if absolute materialism is right, we who have believed in the true and the good, will

hamper our freedom. They would carry into the affairs of the soul the gross egoism of practical life. And then M. Renan gets, as he thinks, on safe ground, and reminds us of the great saying, "Blessed are they who have not seen and yet have believed." But wherein does their blessedness consist? Not surely in a mere act of credence unwarranted by proof. If this were blessed, either intellectually or morally, we should find the most beatified human beings among the most contemptible members of our race. The blessedness spoken of in the saying which M. Renan quotes—"eternal symbol," as it no doubt is, "of the tender and generous idealism which has a horror of touching with the hands what should be seen only with the heart"—is a symbol also of what is more important, of that keen and eager appreciation of moral beauty which is wholly independent of physical signs and wonders. But the charm of the situation, as M. Renan calls it, is not in the blind acceptance of given dogmas, of which act the intrinsic moral quality is rather bad than good, but in the ready, unreserved and hearty acceptance, without visible miraculous attestation of statements or exemplifications of moral truth which are self-commendatory to those who are "blessed" in the possession of sound and sympathetic moral perceptions.

To assign virtue to sheer unintelligent or rapturous trust, is pure sentimentalism. To honour the nature which appreciates moral greatness when it sees it is to recognise that right of private judgment which in morals, as in religion, is the sole charter of human good and human improvement. So also it is sentimental absurdity to praise Marcus Aurelius for purposely avoiding putting himself in accord with himself about God and the soul. But it is rational to praise Marcus Aurelius for having loftily detached the essence of moral beauty from all cut-and-dry theology, and for having assumed that duty does not depend on any metaphysical opinion as to the First Cause.

Having elevated blind faith into a moral virtue, M. Renan recurs to his former mood. He flies off at a tangent and denies the merit or even the possibility of disinterested virtue. This is a still more immoral error. It is possible that some sort of chivalrous rudimentary virtue may be encouraged by eulogising the habit of wholesale belief in what has seized on the imagination by a certain vague grandeur of goodness; but only evil can arise out of the assumption that the claims of righteousness upon men are either logically or actually affected by the association of righteousness with any sort of personal advantage. The entire absence of any such supposition—the cogent contradiction of any such supposition—by Marcus Aurelius, is the crowning merit of his “Thoughts,” and we should have to think ill of Christianity if it were true that Christianity had discredited the intrinsic attractions of virtue by the introduction of its system of incentives and penalties. Of course we know it is far otherwise, and that, according to its own text-books, growth in the Christian life means growth in self-sacrifice, in the practice of virtue and beneficence for their own sakes or for the sake of sympathy with the Divine character as revealed in a human form, and that only in the most elementary stages of religious consciousness are the terrors of the law or the allurements of future reward the allowed motives of Christian conduct. But M. Renan—so sentimental in his admiration of unsupported faith—is most practical in his rejection of unrewarded virtue. When Marcus Aurelius asks himself how it is that the gods have neglected to secure immortality to good men, and consoles himself with the orthodox reflection that they are sovereignly just and do all things in conformity with nature, so that whatever is as they order it must be right, M. Renan breaks out into protest. “Ah! dear Master,” he cries, “this is too much resignation. If it were really so we should have a right to complain. To say that if the world has no

Christian morality, which does not really allow ideas of mortality or immortality to affect its standards, but to many Christian moralists, who, in their unnecessary eagerness to defend the doctrine of immortality, which cannot be the better of such ill-judged support, are ready to sacrifice more important and fundamental principles.

M. Renan, because Marcus Aurelius is not shaken in his love of virtue by the reflection that according to his lights it will have no future reward, accuses him of pushing self-renunciation, like the Christian ascetics, to dryness and subtlety. There is this great distinction, that the Christian ascetics, at whom M. Renan sneers, so far as they were not engaged in a legitimate warfare against their own corruptions, supposed themselves to be accumulating merit by arbitrary and unintelligent self-denial; while the great Stoic-Emperor having adopted for himself on its merits a high standard and practice of virtue, was incapable of suffering the disturbance of that standard or that practice by irrelevant reflections as to the duration of existence. To him, as it should be to us, it was the same whether a man was to exist for a day, or for a century, or for an eternity. The moment brings its duty. The experience, the learning, the biography, the history, the religion of mankind in all ages, revised by the latest discussions, have prepared and corrected for each moment, be its duty great or small, simple or complex, the canon of conduct which it behoves the individual to consider, and presumably to obey, in the exigency which is upon him. His own past training in life, in so far as it has been good, will aid him to appreciate and perform his duty. In so far as it has been bad, it is one of the forces which he should subdue by the contemplation of sound precept and example, in order that his duty may be done. If he is in that state of childhood and rude pupilage in which many remain all their days for want of higher moral culture, he may be somewhat,

though not much, the better for thoughts of the lash of future punishment, or of the amenities of future reward. But if he is as sound and enlightened an agnostic moralist as Marcus Aurelius, or if, in the phraseology and fact which are dearer to most of us than any agnostic freedom, he has entered into the perfect liberty of the children of God, punishment is an idea that cannot enter into his mind; and reward, though a sympathetic subject of contemplation, will never affect his conduct.

M. Renan says that Marcus Aurelius erred through excess of piety, and that if he had been less resigned he would have been more just. What may this mean? It seems to imply that some injustice is perpetrated upon man if he is expected to behave righteously without reward. But to behave righteously is the right, that is the straight, line of conduct, from which no man can deviate without dishonour. Abolish the ideas of moral consciousness and self-esteem, and you may, if you please, discuss the utility of future rewards and punishments as the only influences that can make for virtue. But the virtue so produced will be mechanical and unworthy of the name. So long as moral consciousness and self-respect exist, rectitude and benevolence of conduct must have their own inherent attractiveness apart from any reward to which they may lead hereafter. And is it true that only hereafter does goodness bring its reward? Are the satisfactions of fulfilling duty, of relieving the distressed, of lessening the darkness of mankind, of improving society, fabulous or illusory? Is every good man in this life a Lazarus at the gate of opulent iniquity? If it were so, would any good man, even as a mere question of enjoyment or comfort, change places with the Dives at whose portal he lies? Are the joys of well-doing so poor, so intangible, or so unreal, that a great critic and moralist may point those who do well to the fribble or the scoundrel as one who has the better of them in

felicity? Are we all deluded when we say and teach that virtue secures the highest and most complete enjoyment, and avoids with absolute certainty the keenest pangs of mental suffering? Is the man who turns aside from temptation and suppresses selfishness usually or ever a miserable man?

I am ashamed to put these questions, to which there can be only one reply; but surely it is necessary when a man of European reputation, amid the applause of Christendom, announces that virtue for its own sake is not to be expected; that to expect it were unjust, and that Christian devotion avoiding the dry and subtle counsels of perfection, must dedicate itself to the good fight because, and only because, the soldiers in that warfare are well paid. "The religion of Marcus Aurelius," says M. Renan, in his admirable peroration, "is the absolute religion, that which results from the simple fact of a lofty moral conscience being face to face with the universe." One would scarcely expect this description after a laboured demonstration that the religion of Marcus Aurelius was lacking in certain selfish inducements which alone, in the opinion of the demonstrator, can make a religion reasonable or just. For my part, I have little concern about the religion of Marcus Aurelius. It was the religion of his time. Enough that it gave what sanction was desirable from it to the ethics of Marcus Aurelius, though, as might be expected, the religious arguments which he adduced for morality were not so strong as those which were derived from first principles and the nature of things. What is much more interesting is the completeness and the soundness of Marcus Aurelius's scheme of conduct. Rarely is it at fault, and when we differ from it the issue may be clearly debated and the merits of it not far to seek.

For example, it must strike all modern readers that the good Emperor, like all the philosophers of his school, attaches too much importance to mere tranquillity. He has none of

that ardour against evil which is expressed in the phrase "Doing well to be angry." He seeks not to kindle any such fervour. He bases a charity which goes very far to efface the distinctions between right and wrong, for purposes of censure, on the common frailties of men and their amenableness to circumstances; and he deprecates the regarding of any such frailties otherwise than with the most indulgent philosophy. In one place he even gives tranquillity and impassiveness precedence over justice, observing—as men of all ages are apt to look for a theological argument when they desire to say anything especially silly—that we ought to be patient with whatever is, out of piety and reverence for the gods. Nothing could be easier than to refute this piece of false morality, and in no case is there any difficulty in bringing this philosopher to book and arguing out with him on ethical grounds any point upon which he appears to have fallen short or gone astray.

The question how far and in what manner the triumph of Christianity has affected the substance of morals is one quite legitimate for discussion here, and it cannot be quite passed over among the reflections which the *Thoughts of Marcus Aurelius* must suggest. With all our disposition to shut out religious authority in moral questions, we may fairly admit that the Christian revelation as to God has entirely got rid of the ideas which give so artificial an air to the allusions to the gods on moral subjects in the Emperor's writings. The great difference between the ancients and us in the region of theism lies in the God we have to contemplate. With them the interest of the deities in human well-being was a matter of vague faith and very blind faith. With us the evidences, or at any rate the apparent phenomena, are present to every mind of a vast and various sympathetic action of the Divine mind for man's highest moral good—

action which has penetrated every department of life, and pervaded every operation of human intellect—action which, even if the very existence of such a being as God were imaginary, could never lose its value as a subject of study. If this stood alone it would be a much more important addition to the purely ethical domain than the ideas of immortality and rewards and punishment, by which M. Renan appears to set such store.

The morality of the ancients, it may be admitted, was very dry, compared with the generous wine of Christian ethics, and it is undeniable that the enthusiasm of philanthropy, which a celebrated modern writer has truly attributed to our religion, sweeps away with a noble impetuosity half the obstacles which impede the avoidance of evil and the fulfilment of duty. Another religious author has spoken of duty as “the most real and unfathomable thing that mankind can be conscious of—a sublime unity which in its integrity eludes our subtlest analysis, whose form is ever changing, and which in its essence is as infinite as God himself.” Though there is somewhat of this in Marcus Aurelius, it will be admitted that as an actively operating idea of conscious and zealous well-doing it came in with Christianity.

We ought not to shrink from saying, either, that Christianity introduced an important change in giving formal prominence to repentance and conversion, phenomena which, systematised and popularised as they are by Christianity so as to include potentially all mankind who are brought under the influence or within cognisance of religion, though they do not affect the moral judgment, must greatly increase the aggregate force of the agencies and influences in the world which make for moral conduct. Also Christianity has done good service in the moral region by correcting the supposed light of nature and making the natural man a factor to be subdued or regulated rather than taken for a guide, as was

the somewhat fantastic notion of several other philosophies. It is easy to say with confidence what is and what is not to be found in ancient authors and systems, and it is by no means so easy to prove that the novelties of modern times are absolutely new. But the things I have just briefly indicated are unquestionably Christian contributions to the common stock of our moral well-being.

In reviewing them, however, what have we found? Nothing mysterious or magical, nothing whose working upon human intelligence and emotion is inexplicable or capricious; nothing but what is plainly valuable on its merits as judged by the enlightened mind; nothing, therefore, that can give the religion a claim, even if anything could give any religion a claim, to over-ride the principles of morals arrived by independent judgment. In fact, as we have been independently awarding to Christianity the homage which it has proved itself by its manifest moral merits to deserve, so by analogy we are entitled to pronounce independently on moral questions: for the greater includes the less; and if we are entitled to judge religion on moral grounds, we must be entitled to judge on moral grounds, independently of religion, the actions and sentiments of daily life, though the inspiring of such actions and sentiments is one of the most important practical offices of religion.

We are not to be debarred of this prerogative or diverted from its exercise by any feeling, however just, of the weakness and insufficiency of individual reason. We are to face the fact, that whether our minds be great or small they are the whole machinery we have or ever shall have for dealing with moral problems. To inform the mind by the importation of whatever it discerns or supposes to be sound knowledge, to purify it by the inhalation of all the good moral atmosphere that can be found, these are the obvious duties of each person. These, however, are duties, and they

are obvious, because upon the mind it devolves not only to choose the right when its obligation is perceived, but to determine that obligation; to pronounce on the validity of any authority which assumes to declare it; and to judge of that validity clearly and finally on the moral merits of the requirements of the authority which claims obedience; and not upon any supposition that ostensible prerogative of control can dispense with or must infallibly ensure moral soundness and accuracy. From the moment when the right of private judgment in religion was added to the acknowledged franchises of mankind—and it is now exercised in some sort by the educated professors of every faith alike—this corresponding privilege of private judgment in morals was a necessary corollary. Indeed, it is in the essential nature of duly exercised responsible intelligence.

There is a very beautiful passage in "Modern Painters," in which Mr. Ruskin pointedly and profoundly asserts the absolute dependence of each man on his own moral and intellectual being. "The revelation does not tell you . . . Out of your own heart you may know . . . In no other possible way—by no other help or sign. All the words and sounds ever uttered, all the revelations of cloud or flame or crystal are utterly powerless. They cannot tell you in the smallest point . . . Only the broken mirror can. 'But His thoughts are not as our thoughts.' No: the sea is not as the standing pool, by the wayside. Yet when the breeze crisps the pool, you may see the image of the breakers and the likeness of the foam. Nay, in some sort the same foam. If the sea is for ever invisible to you, something you may learn of it from the pool. Nothing assuredly any otherwise. 'But this poor miserable Me. Is this, then, all the book I have got to read . . . ?' Yes, truly so. No other book nor fragment of book than that will you ever find. No velvet-bound missal, nor frankincensed manuscript; nothing hiero-

glyphic nor cuneiform ; papyrus and pyramid are alike silent on the matter. Nothing in the clouds above nor in the earth beneath. That flesh-bound volume is the only revelation that is, that was, or that can be. In that is the image of God painted. In that is the law of God written. In that is the promise of God revealed. Know thyself, for through thyself only thou canst know God. Through the glass darkly ; but except through the glass, in nowise. A tremulous crystal, waved as water, poured out upon the ground ;—you may defile it, despise it, pollute it, at your pleasure and at your peril ; for on the peace of those weak waves must all the heaven you shall ever gain be first seen ; and through such purity as you can win for those dark waves must all the light of the risen Sun of Righteousness be bent down by faint refraction. Cleanse them and calm them as you love your life.”

I will not weaken by any words of my own this powerful assertion of my doctrine. The earnest and even devotional tone of the great writer is the best rebuke to any one who supposes that the doctrine is likely to lead to any lightening of moral responsibility. It may be supposed, however, that I have used a dangerous phrase in speaking of the right of private judgment in morals. Now, I need scarcely say that it is not within the scope of possibility for the private judgment of sane men to deviate much from the received and practised code of primary and ordinary moral duty. But the right to hold heterodox views of morality is neither more nor less valid than the right to believe in the earth being flat or in squaring the circle. If a man is grossly wrong on morals or grossly wrong in mathematics, his fellow-men calmly, and as a rule justly, conclude either that he is half-educated or that his reason is unhinged or so far deficient that he cannot logically use the knowledge in his possession.

Society easily protects itself against any consequences that might accrue to any of its members from the mad mathematician's vagaries, and can punish either by law or by public opinion any of the mad moralist's escapades. But the freedom of speculation is exactly identical in the two cases, and any interference with it must be at the risk of preventing discoveries and reducing the effective value of human thought and enquiry, which, I repeat, is all we have to depend upon. If you say, "No, we have revelation," I reply that according to the opinion generally prevalent among us, and according to the practice of many who do not hold the opinion, private judgment is the recognised judge of the authority of revelation; that the morality of the purport of revelation must enter into the considerations upon which private judgment must be convinced of the authority of revelation, and that a well-ordered mind could not accept as authoritative a revelation which contradicted principles of morality which to that mind appeared essential.

The result of these facts operating in connexion with the standards of the Christian religion has been most beneficial both to faith and morals. It has given beneficial interpretations to much in the received revelation which at the first blush, and understood as simple readers may understand it, is intolerable. It has in the opposite direction given beneficial pause to ethics when the temptation has arisen to sweep away from the contemplation of mankind many tales of horror which are found in the writings that are most venerated by Christendom. If I were not somewhat deterred by a dread of too far disregarding our prohibition of religious polemics, I could produce many instances as proofs of the abiding necessity of both these operations.

As to the latter (namely, the arrest of judgment on passages of sacred literature, which *primâ facie* are in conflict with the moral sense) a philosophical contemplation

of the more repulsive records of the Old Testament—as read Sunday after Sunday in our churches in accents of mechanical sanctity which belie the feelings with which they are listened to by the majority of educated listeners—will I believe justify their retention; though it is very desirable that they should be accompanied by wise pulpit instruction instead of being passed over in silence which greatly resembles shame, or commented upon with a folly which aggravates the superficial evil of their teachings. They are, in fact, reflections of primitive conditions of society, and of elements of force and fraud which are more or less to be reckoned with in all conditions of society. And no sacred literature would be completely human which did not thus reflect facts of life more prominent in certain ages than in others, but present appreciably in all.

A remarkable illustration has been afforded in our own day of the abiding place of the element of violence in practical ethics by the writings of Carlyle and of his followers, Kingsley, Froude and Ruskin—all men of the gentlest character, but in whom the worship of right has been largely a worship of force. Before Carlyle arose it was unknown for more than a hundred previous years for force to be glorified, except in the empty jingles of patriotism—in its ordinary forms one of the greatest of public nuisances. Carlyle was deeply impressed with the proofs in history of the potency of pure force, especially of pure force directed by powerful individuals, and of the extent to which it had contributed to the progress of mankind and to the development of good as well as the eradication of evil. He devoted his great abilities to the illumination of this theme. His imagination endued his Heroes with conscious moral purpose, or still more daringly, found pleas for their superiority to moral considerations. He pictured them consciously or, unconsciously fighting the battle of humanity, and he descanted on their

deeds of blood and iron in language often adopted from Old Testament literature. The revival was protested against by our modern spirit. The world had become accustomed to hear all war that was not defensive condemned or disingenuously palliated. There was a general shock when a pen evidently dipped in righteousness was devoted to celebrate sheer force ; and for a time the entrance of such ideas was stoutly resisted. Then came a time in which they were only too absolutely accepted, especially by young men, and afterwards a time when their truth, or at least the necessity of taking them into account as an element of human life, was admitted with rational and moral limitations. This episode in our literature—not yet terminated, as may be seen by Mr. Froude's last writing on Ireland—is a striking justification, not indeed of the code of force, for force must always be in some sense amenable to the code of morals, but of the preservation in sacred chronicles of many incidents, not fit certainly for direct imitation in life under changed circumstances, but instructive as bringing before the mind passions and impulses formidable both for good and evil, which cannot but enter largely into the purview of government, whether human or divine. We may thus infer that the science of morals, being apt to be transcendental and to float a little over the heads of average humanity, is somewhat indebted to Religion when Religion thus arrests judgment on inevitable events, and submits problems that are at once most difficult and necessary to decide, and fraught with principles the right understanding of which, without excess on either side, must tend greatly to human happiness.

In return, as was just now said, Religion is much benefited by being brought to the test of morals. By this means Religion is developed and completed. By this means Religion, as at first misunderstood, is corrected and improved. And if these are fit functions for Ethics to perform

through the instruments of literature and philosophy, the process is a fit one to be contemplated by a Literary and Philosophical assembly.

In the sacred writings which compose what is called the Bible, there is, except in the Levitical law, nothing systematic. We may accept absolutely the sacred canon as settled by the Church, but the definite limitation of Scripture so effected does not in the least degree alter the incidental and, humanly speaking, the accidental manner in which this mass of sacred literature has been conceived, produced and accumulated. Every part of it had a temporary purpose, almost a personal purpose, and, certainly, until the Christian era, a purpose limited to the interests and moral education of a single and not very large nation. When the Christian dispensation began, this special restriction of religion to a race ceased, but for it was naturally substituted a limitation of spiritual culture to a small though growing sect. The eye of faith, instructed by the vast and uniformly tending events of nearly two thousand years, as well as by a great body of expository and hortatory literature, sees in almost every line of the Scriptures a vast and elastic capability of general application; but this is so much a matter of teaching and habit of thought, that it may be lost or acquired in a single generation. To a fresh mind, only sufficiently tutored to understand the original object and significance of what has been written—which, by the way, has seldom been much dwelt upon in Christian teaching—marks of purely local and purely temporary application would be abundantly visible. Hence the value of historical criticism as an implement of interpretation, without any reference to its value as throwing light on the production and authority of the books.

Now, when the sacred writings of a religion are largely local and temporary in tone and aim, and when historical criticism is necessary, first, to give them textual value, and,

secondly, to give them ascertained interpretation, it is clear that for ethical purposes these writings must be very different from any moral code of a systematic kind, such as the founder of a religion or a college of his disciples might be expected to formulate. A great deal of tentative reconciliation is necessary in order to obtain the full and exact force of their ethical teaching ; and, as a matter of fact, preconceptions derived from those of the writings which are more advanced in moral perfection have to be applied to those portions which are less advanced in order to compose a system even approximately perfect.

In the great historical churches this has been very scientifically done, and in the Roman church especially the body of systematic ethics which has been incorporated from the Bible, and Aristotle, and St. Thomas Aquinas, is the admiration of all philosophers. From this point other great churchmen, with varying success and utility, have carried on the often decried but very necessary science of casuistry. In ruder ways the same process of systematising moral philosophy under ecclesiastical or spiritual sanction has gone on in every Christian communion ; and among average Protestants, who are extremely indifferent to the learning and theology of their religion, it is the common practice for passages of scripture (the only Protestant text-book) which present moral difficulties to be interpreted either by the layman's rule-of-thumb, or by the application to them of the special moral judgments of preachers and teachers of repute and authority, or by what a very able Scottish divine has called "the ecclesiastical measuring rod which has been in use for centuries." The last process, usually among Protestants a lamentable exhibition of awkward incompetency, need not be taken into account, though many curious instances might be given of the ethical follies which are committed in the pulpit when ill-instructed amateurs attempt to wield the measuring rod

in the manner of the great masters of ecclesiastical interpretation.

The other methods (lay judgment and pulpit interpretations) are alike, it seems to me, in the meritorious peculiarity of aiming to illustrate and succeeding in illustrating the conformity of the moral teaching of religion to the dictates of Ethics as independently and rationally arrived at. All the great theological moralists have taken to their study of theology certain ideas of what was right. As society has advanced under the lead of literature and philosophy, its ascertained moral code has advanced, often, let us gladly admit, owing much to the development of the moral sense by religious influences, and to the germination of doctrines, the ultimate growth of which was but little suspected in the earlier, or indeed in any previous, ages. At each such advance the Christian philosophers of the day have found the Christian system consistent with the newly-ascertained and settled moral principle, whether in public or private matters. And so those who hold the Christian faith must believe it will always be, just as they are firmly persuaded that the ultimate discoveries of science will not conflict with the Christian standards rightly understood.

I claim, however, more earnestly than it is commonly claimed, for moral science an authority as independent as can be conceded to physical science; rights of autocratic assertion as absolute if not more absolute than physical science has latterly come to enjoy. I protest against the supposition that moral science any more than physical is to be at the mercy of theological dicta. The progress of the world from this moment may be quite as intimately dependent on the freedom of moral speculation as on the freedom of scientific research. And assuredly the course of history is strewn with many more proofs of the disastrous results of the protection of moral and social evil by the received

theology of the time than of delay in progress occasioned by ecclesiastical interruption or condemnation of physical discovery. Up to this very moment moral laws are supposed to be under the exclusive patronage and custody of revelation; and proposals for the good of mankind, which ought to be judged on their merits, have first to undergo the perplexing if not degrading ordeal of establishing either that they are not amenable to pious censures, or that the censures to which they are amenable are not truly pious.

In the July number of the *British Quarterly Review*, there is to be found, from the pen of so eminent and liberal a divine as Dr. Leathes, an illustration of this unfortunate tendency of the ecclesiastical mind. In a careful review of the Decalogue—the review itself being an example of the amplifying and imaginative manner in which the crude and elementary prohibitions of the Mosaic law are expanded and refined in support of theological pretensions to sole moral authority—Dr. Leathes aims to show, not merely that the Ten Commandments, as he freely interprets them, condemn every form of moral evil, but that they condemn moral evil in the only conclusive manner, because by the Divine authority. It seems to me a rather circular method to argue that the Decalogue must be divine because it is sound, and could not be sound if it were not divine; but we are more interested in certain points of peculiar heat and emphasis at which Dr. Leathes brings into contact special dangers of the times, and the special need of a divine revelation of morals. He tells us very truly that subordination in human society is among the first of moral principles; and, with the usual latitude of such demonstrators, he assumes (what would be denied by a literalist and held by any ingenious arguer on the subject to be an assumption so feeble and impracticable as to be useless for logical purposes) that the

general principle of subordination is included in the commandment to honour fathers and mothers. He might with equal truth have said that it is necessarily included, in the full sense in which it is essential, in the simplest conception of human society. But Dr. Leathes expressly avoids saying this in order to bring out a hobgoblin, and to protest that his hobgoblin can only be exorcised by a theological ban. He says that a minority of modern theorists have been opposed to subordination. He is horrified that they have propounded the speculative notion of the abstract equality of all men. He may well call it speculative, for no ordinary mind can conceive abstract human equality becoming actually perilous to human society. But the danger of it drives Dr. Leathes, or rather, for the purpose of his argument he pretends that it drives him, for shelter to revelation. First exhibiting his confidence in the reason of mankind by urging the supposed social peril as good ground for accepting and valuing the fifth commandment on its indirect merits, he next withholds his confidence absolutely, asserting that the intrinsic absurdity and evil of abstract human equality will not suffice without a divine prohibition to prevent the reason of mankind from adopting the idea. Once discredit the supernatural authority of the fifth commandment, "and it is easy," says Dr. Leathes, "to see that a blow is struck at" subordination. "In this respect, therefore,"—Dr. Leathes makes an extraordinary use of his *ergo*—"morality stands or falls with religion." Now the common sense philosophy of this matter clearly is, that a moral code issued by the Divine Being might naturally include honour to parents—curiously enough, obedience is not literally included in the command—and honouring parents may naturally be acknowledged to imply reverence for all properly constituted human authority or superiority. But to assert that these would not have been duties if they had not been mentioned in a super-

natural code is, in the first place, absurd on the face of it, and, in the second place, cuts the ground from under this divine's own argument, because his case is, that subordination is necessary for society, and has been proved to be so by the universal experience of mankind. If this does not establish the moral duty of maintaining it, what can? The evil of an argument of this sort lies, however, not in its theoretical defects, but in the practical purpose that will be attributed to it, and the use to which it will be put. There has not been a step in the direction of improving the mass of mankind which might not, nay which has not, been opposed by arguments of this tenor; and the strength of such arguments lies not in their being truly founded on the basis of the Decalogue, nor in their being sound in themselves, but, as Dr. Leathes seems to perceive, in their being supposititiously sanctioned by an authority so sublime and terrible as to awe the vulgar mind into leaving unquestioned the thesis they are intended to support.

The same writer affords an example of mental and ethical confusion yet more gross when he comes to the eighth commandment, "Thou shalt not steal." He treats this injunction in a most mysterious manner under the influence of certain social apprehensions, but without the faintest conception of its real difficulties. His aim, pursued with impetuous confusion of thought, is to establish that nothing but the most rigid observance of ownership can save society from convulsions, and that only a Divine injunction can secure that ownership shall be rigidly observed. Now, property as we all know is under the guardianship of society. Its sacredness must depend entirely upon the compliance of its owners with such laws as the community finds to be necessary in reference to it. A simple instruction not to steal is amply sufficient for the ordinary guidance of individual human conduct, but it leaves unsettled many matters

which must present difficulties in the treatment of property on a larger scale, such as the length of possession which constitutes an indefeasible title and the degree of public necessity or convenience which will justify interference with proprietary rights. It is on such points as these that differences of opinion arise in the treatment of property questions, and upon all such points a mere general and simple commandment not to steal is of necessity silent. Yet it is manifestly of possible mistakes and crimes in this direction that Dr. Leathes is thinking. He, therefore, factitiously discovers in the Decalogue commandment a wholesale and 'retail prohibition of interference with property which every tyro must know to be absolutely impracticable, and which is only promulgated anywhere as a sort of random and desperate outwork against public improvements and reforming legislation.

The force of "Thou shalt not steal" is obligatory and plain under all circumstances where on the one hand the best sense and the real interests of Society are considered, and where on the other the rights and liberties of the individual are not invaded. Under such circumstances property is not to be disturbed in its present distribution. If you say the description of the circumstances is very vague, I reply that it must be in the very nature of the case. The rights of property vary in every country by the laws, in every county through variations of management and expenditure, in every district which differs from another in agricultural customs, in different conditions of life according to those conditions. All moralists, for instance, agree that a man may steal to save his life, although no such exception is specified in the eighth commandment. Very respectable Christian divines used to argue—and unanswerably too if interpretation was to be literal—that any slave violated the eighth commandment who ran away from his master. And it is only a literal and

absolute reading of the commandment—that is, a reading which holds sacred the distribution of property as it actually exists—that can serve the purpose of Dr. Leathes. His argument—or rather his promiscuous group of assertions in argumentative disguise—goes to insist on the absolute sacredness of all property at all times. He is not content that this should exist as a human, conventional arrangement, as it undoubtedly did long before the ten commandments were given. There is rooted in him the base and foolish notion that men have no duty to each other, except indirectly because of their duty to God, and so he argues that there would be nothing immoral in violating property if it were only guaranteed by society for social reasons, though it is clear the moral quality of a thievish or rapacious action must be practically the same in both cases. He implies, moreover, that the eighth commandment divinely condemns community of goods, so that we must presume the early Christians outraged it when they had all things in common. With a fatuity scarcely to be accounted for even in a man who has never read anything but theology, Dr. Leathes insists that if it were not for the restraint of a Divine prohibition there would be no reason why any man should not place himself outside the mutual obligation of honesty by coolly taking possession of his neighbour's goods. “Nor does it,” he says, “seem possible to avoid” the gradual disintegration of society in this way “unless there is some invisible authority independent of, and external to, society, which offers itself as the guardian of its interests.” “Society,” Dr. Leathes says, “is an abstraction and”—contrary surely to daily experience—“we cannot be responsible to abstractions.” “I cannot,” says he, “be responsible to society in any other sense than I am responsible to the several members of society individually and collectively;” but he does not define why this should not suffice for social obligation. He even goes so far—this

Christian moralist—as to say, that unless his obligation to truth depends upon his relation to God, he is only so far pledged to truth towards his fellow creatures as they regard themselves pledged to truth towards him. “Unless,” says he, “I can be sure that they regard themselves as pledged to deal truly by me, I can never be without an excuse for acting untruly towards them.” Anything more odiously immoral was never heard. And it is put forward, forsooth, as a defence of morality. The real motive is to defend dogma; but if dogma could only be maintained by abnegating whatever is good and moral in independent character and social instincts, dogma would be better got rid of.

With all reverence, it comes to this: Are we to honour God because he is goodness personified; or are we to hold ourselves free to despise goodness until it is proved to be Divine? It is with great pain, and still greater surprise, that one has to protest against the latter alternative as the fixed and elaborately defended opinion of a distinguished theologian who employs for the purpose the pages of one of our most respectable reviews. But the protest must be registered. If the effect of such teaching were only likely to be the discouragement of sound public legislation by the intervention of superstitious demurrers, it would be open to the severest condemnation; but it seems to threaten—or would threaten if it were likely to be listened to—the whole foundations of moral conviction; whether those foundations be taken to be the proofs of utility, or the innate persuasions of the mind in favour of right and benevolence. Either this, or the foundations of our reverence, must be sapped by our being convinced that a community left in a state of nature with our present qualities and faculties of judgment, but without a divinely issued Decalogue, might have arrived, and would have been justified in arriving, at conclusions in favour of all that is immoral and vile.

The value of Religion in morals lies in the emotion with which it energises principles that are established by reason. That emotion takes the form of gratitude and affection towards the Creator; of loving anxiety to fulfil what must be pleasing to him because it is good, and what he has commanded in order that it may the more easily be upheld and enforced among men; of generous desire, for God's honour, as well as for man's sake, to do all the good that can be done to our fellow-creatures. Such impulses, supported as they are by clouds of witnesses, and volumes of Christian thought and teaching—fed as they are in the devout by constant communion with the Supreme Being, in whom is all the fulness of the highest excellence—must give the Christian man sublime moral advantages. This is admitted even by many of those who cannot adopt Christian dogmas. But as candidly and absolutely must we admit that the least rift of immorality, or even of arbitrary morality, or of indifference, however pietistic, to the ineffaceable distinctions of morality, must destroy the music of the lute. True companionship with the Divine can only exist in purity and perfection where there is a prior and intelligent persuasion of the essential and independent rectitude and goodness of everything to which the sanction of the Deity is accorded.

The spirit and habit of the desperate yet flippant theology of which Dr. Leathes's essay is an example, is first to base morality on dubious and unintelligible foundations, and then to seek to render those foundations more intelligible and less dubious by forced and arbitrary deliverances; and if the age were submissive to ecclesiastical domination this might prove dangerous to moral science. Moral science, however, in these times can take care of itself, and even wise legislation, against which the arbitrary morals of ecclesiasticism are always readily and eagerly opposed, is only for a time delayed. We

need not, therefore, rate very highly the evil consequences of the fallacies against which we are contending. Yet they are evil, and they are important. In the higher strata of life and education these consequences are twofold. From identifying religion and morals too closely, there is an indisposition on the part of many to recognise the value of secular improvements, and there is an inclination to submit too readily to theological difficulties, or to objections which have managed to obtain for themselves theological prestige. On the other hand, large numbers of educated men are alienated from religion by the pernicious nonsense which is talked in its name.

In one of the contributions to magazines in which, during the present year, this theme has been largely discussed, I read that if religion is not true it is a warrantable action to knock a cripple's crutch from under him. Are men of intelligence expected to hear things of this sort with patience? Are they to be left under the impression that to accept Christian theism is to abandon all faith in any morality that is not arbitrary, and to believe that the most base and cruel action would be as good as the noblest and most generous but for the latter having been required of us by a higher power? It is not wonderful that men of just minds, especially in days when physical science interposes a certain amount of intellectual difficulty, should turn away repelled from a religion the most prominent adherents of which in controversy express themselves on moral subjects in terms which are absolutely inconsistent with soundness of moral sympathies. Such men, looking round upon those who indulge in these paradoxical arguments for the faith, must feel that the snuggest berth in the harbour of orthodoxy would be dearly purchased by the loss of the sheet-anchor of moral principle, and must be tempted to doubt whether persons whose only moral guide is theological dogma, and

who openly disavow all pretensions to moral judgment, are fit to be trusted in the affairs of life. Can we expect those who are superior to such pietistic frivolity to cast in their lot with persons whom they cannot but suppose to be enfeebled and cabined by so artificial a moral system?

My hope is that it may be possible to retain them by reconciling the claims of Religion with a sounder basis of moral authority. Many in these days are parting with the conceptions which have yielded peace and every sort of good to generations of their forefathers. Some are doing so with the acute pain at severing themselves from the idea of "the Great Companion," which was so affectingly expressed by the late Professor Clifford. This is not the place to pronounce for or against any particular belief, but we need not disguise from ourselves that any change of opinion in the direction of atheism, however caused, is, in the view of most of us, an event of the most melancholy character. Sometimes the pressure of conviction, or of the absence of conviction, compels the profession of agnostic views. Not seldom they are avowed, or secretly entertained, because of the impossibility of tolerating the folly and bigotry which even in high places is identified with the profession and advocacy of religion. Let us at least set down, in reference to the difficulty which has been gratuitously created on the subject of morals, that it is easy for any man to emancipate himself from this difficulty without any loss of religious sympathy. If we allow and realise that the educated moral sense must not be over-ruled by any theological dictum, we shall find that there will be no conflict between ethics and religion, and neither religionist nor moralist will ever suffer any embarrassment, because the latter accepts theology and the former studies morals.

When we consider how often religionists and moralists have been somewhat embittered against each other, and how

seriously bitterness hinders the prevalence of sound views, we shall be led to confess that it were a good achievement to induce theological persons to be content with a philosophical basis for morality, and to forego the transcendental one on which it has been their habit to insist. At the present moment there is no immediate prospect of any ethical discussion taking a practical form; but within the memory of many of us the doctrine of human liberty has been forced upon unwilling Church authorities in America, where the Christian Church in the Southern States fought vigorously to the last in favour of slavery. The modern popularisation of divorce, whatever that may be worth, is a similar encroachment not yet acquiesced in by a considerable section of divines, and a great writer has hinted that the laws of marriage are capable of further amelioration, if our legislators are capable of freeing themselves from theological shackles. In France the popular choice of government is hampered, and Church liberties are jeopardised through the existence of certain moral scruples which, though very injurious, are quite as respectable as many others which from time to time have risen on religious grounds. In England the laws and customs affecting the employment of one-seventh of the time of the community, and a much greater proportion of its leisure, are withheld by a theological *distringas* from intelligent moral settlement. It is quite unnecessary, however, to attempt to forecast individual controversies, which must be of less consequence than the general principle upon which they will be decided. Whatever comes of the progress of moral science will, we may be sure, be reconcilable with the text-books of religion, which never yet failed to be conciliated under such circumstances, and which are now interpreted on principles that guarantee them against conflict with the enlightened sense of mankind.

In this respect the historic faculty is invaluable, and we

may test it if we please at any age of the Church. As an illustration, let us take one aspect of the period which is covered by the Pauline epistles. In that body of sacred literature there is no deficiency of glow and colour; but it is the glow and colour of martyrdom, and of an anticipated future in which martyrdom was to be eclipsed by a far more exceeding and eternal weight of glory. In its aspect towards earthly citizenship—that is, towards social and civic duty—it is cold and tame. There are many—there must always be many—who read the epistles as if they were written in and for our time, and as if the phases of truth which they present in reference to sublunary matters were of perpetual application. To think so is to ignore the moral and material conquest which has made Europe Christendom, and which has substituted for the Roman Empire a great company of nations whose citizens are all Christians, whose wealth is Christian wealth, whose greatness is Christian greatness. It is not conceivable that if the apostles had been writing for a Christendom whose secular glories are identified with the doctrines of the Cross, they would have expressed themselves on political and social matters as they did in writing for a poor, despised and furtive flock, whose constant dread was martyrdom, whose only chance of peace was obscurity, and whose hopes could scarcely be said to have any object on this side the grave. Hence the tone of politic submission to the powers that be—hence the absence of all recognition of secular citizenship—hence the fact that the beauty of primitive Christianity is deformed by the badge of sufferance.

The life of a martyr is not all imposing. We see him in imagination brought to the stake or thrown to the lions. Sure of the greatness of his soul, we imagine for him rapt serenity of countenance and lofty nobility of attitude. Even in that we may be mistaken. His form may cower;

his teeth may chatter ; his face may be sicklied over with a pallor despised and ridiculed by those around him. The eyes of his body may shrink from the sight of the flame or of the wild beast, though the vision of his mind may be resolutely fixed on the bright hereafter. Even if his presence is heroic at the crowning moment, there must be much to remember of his past that was not heroic. For this martyr must have been chased and hunted and harried. He has doubled ere now on his pursuers. Flights, evasions, compromises must have been to a great extent the business of his life. And such was largely the early life of the Church. These experiences left their mark on the first forms of Christianity—a mark of excessive caution, of abstention from citizen life, of negation as to public spirit and public affairs. All this—which must be felt so keenly by men of public life who read the epistles with modern eyes—is perfectly comprehensible and justifiable, and gives the atmosphere of true reality to the story which those writings tell. But the truer the story—the more interesting and just the correspondence of the sacred teachings with the circumstances of the time—the more necessary is it to understand that the details and even the spirit of the epistles in secular matters, are not to be applied to the duty of Christian men in ages when Christians are what Romans were, when Christianity rules of right, through Christian states, the destiny of the world, and when secular citizenship is one of the first of religious obligations. Yet you will bear me witness that even till lately, and even now, the truth of this matter has not been wholly perceived. A line has been drawn between the church and the world which has robbed the church of wholesome power and the world of much pure and invaluable service. I can remember when the late Thomas Binney caused no little commotion throughout a considerable proportion of English “religious circles,” as they are called, by supporting the not

very daring proposition that it is allowable to make the best of both worlds. Till lately such a thing as a highly religious statesman would have been thought almost a contradiction in terms, and when our religious men were political they were expected, like Wilberforce, to use their positions mainly for such purely philanthropic objects as scarcely went beyond the domain of religious action. We need not pursue the argument into trivialities. The purpose of it is to suggest how much the scope and compass of religion have been circumscribed by two things—the lack of intelligent historical and literary criticism and an arbitrary technical and textual use of the sacred writings as referees on morals. A great deal of faulty and imperfect action would be avoided among men of culture and intellectual power if for the future the complete independence of moral judgment were fully apprehended. True interpretation of the sacred text-books would speedily follow, and it would be seen that whatever is philosophically right is in full harmony with the rudimentary ethics of the Christian faith.

If we glance lower down in the scale of society and education, we shall find that if there is not so much to be hoped from the introduction of our thesis, there is even more to be desired. Nothing can well exceed the waste and prostitution of human intellect that goes on in this country in the name of Religion, especially upon public questions and in the choice of men for public offices. Prejudice usurps and retains control in a manner which is absolutely the despair of those who endeavour to get public measures and public men treated on their merits. It is scarcely an exaggeration to say that anything like an intelligent conception of public duty has yet to be born in many a household whose inhabitants consider themselves fairly educated, while the intrusion of theological dogma or nonsense which is mistaken for it into the domain

which a sense of public duty ought to rule, baffles absolutely all attempts to procure a reasonable consideration of state and social topics, or the support of enlightened men for state or social offices, from large numbers of conscientious persons who ought to be among our very best citizens.

The depth of this ocean of popular religious folly has probably never been sounded, for those who are capable of plumbing it turn from it with disgust. But it is a duty seriously devolving upon us all to do our utmost to substitute everywhere, if our influence can have any effect, the rule of reason for the disturbing influence of religious prejudice, which renders more or less irrational a great proportion of the electoral conduct of voters on both sides of politics in most countries of the world.

The other day I found in a daily newspaper of great circulation, which I know to be conducted by men of knowledge and competency, a letter of a column and a quarter in length. This should denote, not necessarily the concurrence of the conductors of the paper in what was said, but their opinion that it was worthy to be printed, and to occupy a considerable space, and to be allowed its weight with many thousands of readers. I will not name the subject upon which this letter was written, but I will quote as an example of the degree of coherency and reason which suffices to obtain a popular hearing, the conclusion of the epistle, which, I should add, was one of several that appeared in succession in the same columns :—

“What a spectacle for England! (says the writer, who signs his name.) There at Delhi, the capital of Mahometan worship and glory, stands the temple of the Prophet in its simplicity, with its calm and intelligent multitudes as they look with disdain on the rival systems, but with wrath against England, who interposed and kept them from their mission of destroying the Hindoo imagery, and now flaunts another and a foreign display in their face at Simla, and more. If, as must be the case, Mary and ‘the glories of Mary’ are exalted at Simla, as

'the Queen of Heaven,' it will bring our Government and nation into collision with the four hundred millions of Chinese, like the Jews when they fell into the use of images and set up 'a Queen of Heaven,' to whom they 'baked cakes.' (Jer. xlv.) The Chinese also have their 'Queen of Heaven,' to whom they make offerings, especially when going to sea; and the Celestials will not suffer their Queen of Heaven to be outdone or despised either by Kali or Mary. And what will Lord Ripon call the cathedral at Simla? Will he dedicate it to Mary? Of course, since her elevation to the throne and the promulgation of the glories of Mary. Well, what will the Hindoo say? 'Mary-Kuttah Feringee, Simla Sahib; Kali-Kuttah, Hindoo Pariah-dog.' And what will the proud iconoclast from Delhi say as he bides his time and his mission? 'Turn out the Pariah-dogs.' And then once again a more awful Sedan, when 'the vile person shall no more be called liberal, nor the churl said to be bountiful,' for it is written, 'Behold the Lord cometh out of his place to punish the inhabitants of the earth for their iniquity; the earth also shall disclose her blood, and shall no more cover her slain.' (Isaiah xxvi.)"

Is it not ridiculous that a man can write and men can read such stuff as this, taking it to be legitimate argument by which to approach a sound conclusion on a matter which ought to be pronounced upon only under an intelligent sense of moral duty? Is it not lamentable that not only in England, but in France, in America, in Germany and elsewhere, thousands of men record votes which ought to be recorded under a sound feeling of what is politically right, simply under the influence of unintelligible and almost raving theological fanaticism? And, of course, the political is only one aspect of the matter. You may conclude that those who in politics are amenable to nonsense of this kind are below the mark in knowledge, in their appreciation of science and its results, in the manner and spirit in which they educate their children, and in everything in which they can be rendered inferior by the morbid overthrow of their common-sense, and by the displacement of their moral judgment. It may no doubt be asserted that they have spiritual compensations. This is a point which we here have no privilege to discuss. But I will

venture to pronounce that there is no spiritual advantage to be obtained by the practice of religion which is liable to be forfeited by a full and absolute recognition of the indefeasible claims of independently ascertainable moral obligation.

One other consideration has weighed with me in the selection of this subject, and of it I will briefly speak before concluding my address. Owing to special circumstances, the rights of conscience have been under debate this year, and under certain provocations many whom one would have hoped to find sounder in the faith of free opinion have been drawing the line of liberty at theism. Fortunately, the champions of orthodox oppression in the House of Commons were, with the exception of Mr. Newdegate, men who had never been known before to express or exhibit a single religious emotion, while the advocates of freedom even for atheists, and of the exemption of agnosticism from disabilities, were men, who, whatever may be their political merits, have at least given hostages during long years of faithful consistency for the purity and zeal of their Christian character. Now, upon this head, in connexion with my subject, I have only to say that I felt additionally bound to protest against the pretensions of religion to monopolise the authority of morality in a year when foolish and uncongenial champions of religion have attempted to monopolise for the professors of religion civil rights. Religion—I will even say theology—needs no such bulwarks. The more a doctrine is true, the more it owes and must owe to liberty; the more it will suffer from want of liberty. Any falsehood may be aided by tyranny and pampered by social patronage. Truth has only one sure friend, but it is a friend who sticketh closer than a brother; a sure friend; a sufficient; namely, liberty—the right to proclaim itself, and the right of all ideas, true or false, to stand on their own merits socially,

without being ashamed or intimidated by means of disabilities.

In reviewing what I have said, I feel that I may be thought not to have sufficiently endeavoured to establish my fundamental proposition; the practical right of all men to arrive at moral judgments. If, however, I have not laboured this point, it is because with the necessary qualifications it seems to me obvious and indisputable. I will, however, before closing, offer one illustration of the manner in which the moral sense addresses itself to the issues presented to it. Let us take the denunciations by Mr. Ruskin of the moral enormities of Political Economy, with which all my hearers are familiar. With these denunciations we all, to a certain extent, sympathise. Now, why do we in any degree disapprove of the alleged moral enormities of Political Economy? Because moral emotions confer with our reason and show it grounds of condemnation. Why do we pronounce, however, that Ruskin's censures are largely unjustified? Because our reason parleys with our moral emotions, and either corrects or silences them. Thus by the conjoint operation of argument rendered tender by feeling, and feeling rendered just by argument, a sound conclusion is arrived at. But it is thus arrived at. It could not be arrived at by any other process. The mere arbitrary imposition of such a conclusion upon ignorance by an unreasoned religious dogma would not have the same moral value or effect—would always be liable to be disturbed by gusts and surges of seemingly righteous sentiment; or by sordid impulses of hard selfishness glad to have a scientific excuse—and, moreover, however dogmatically fulminated, would really require to be justified to rational men rather by its intrinsic ethical and economical truth than by the authority on which it was pronounced. Look at the matter how we will, the adequately educated man has nothing,

in the last resort, to guide and govern his decision of moral questions but his reasoning and emotional intelligence. He may and should avail himself of every light, and of all assistance, with due regard to the source as well as the tenor of whatever "literature and dogma" can submit to him; but at last his intellect, made healthy by emotion, and his moral sympathy, vindicated by demonstration and criticism, must give the judgment. And, rightly understood, it is the judgment of one judge, not of two—of the right judge, not the wrong; not the judgment of sympathy seducing reason, or of reason overbearing sympathy, but of right reason which has absorbed and assimilated sound sympathy; of reason and sympathy co-operating in unity; of a sympathetic and therefore healthy reason, which is just because also gentle, and gentle because absolutely and comprehensively just.

Very fortunately, no reconciliation is necessary between the Christian religion and moral philosophy, even in the sense in which the Christian religion is supposed to need reconciling to physical science; but when pretensions of arbitrary moral authority are put forward on behalf of theology, it is necessary to demur, because what would have to be hereafter reckoned with if this pretension were allowed would be not the *dictum* of theology, but the *dictum* of any one and every one who fancied himself entitled to speak in the name of theology—which is much less easy to understand and much easier to misuse than the philosophy of morals. For such *dicta* it is quite unnecessary to cherish any respect. So far as they are likely to disturb the sound conclusions of morals, they ought firmly to be repudiated. When Religion rushes officiously forward with an original contribution in aid of morals, it is not usually upon much necessity or in a very enlightened manner. For the ordinary man, and to a certain extent for almost all men,

Religion is a sentinel on the watch to warn from the evil path of wrong or self-indulgence; but I might appeal with confidence to those who are concerned in the public advancement of mankind, whether what passes for Religion is not often to them a potential foe, a possible enemy viciously alert in ambush, an enemy who not only may at any moment frustrate their labours and struggles, but may paralyze with alarm their adherents, and helpers, and disciples. To neutralise this evil it is only necessary to acknowledge the independent prerogative of the understanding in the domain of moral judgment. And if we desire to realise this, I know not that we can have recourse to more effectual testimony and elucidation than that of the great text-book of our religious faith. "For this commandment, which I command thee this day, it is not hidden from thee, neither is it far off: it is not in heaven, that thou shouldest say, Who shall go up for us to heaven, and bring it unto us, that we may hear it and do it? Neither is it beyond the sea that thou shouldest say, Who shall go over the sea for us, and bring it unto us, that we may hear it and do it? But the word is very nigh unto thee, in thy mouth and in thy heart, that thou mayest do it."

THE TALMUD.

By REV. DR. STERN.

WHEN, about half a century before the Christian era, the Jewish sage Shammai was asked by a heathen to teach him the Jewish Law while he (the heathen) was standing on one leg, the great teacher angrily repulsed him, stating that it was impossible to comprise the great variety and fulness of mental knowledge and moral truths, as expressed in the Law, into one short and limited sentence. On addressing himself subsequently to a still greater teacher of another famous school—Hillel—the latter replied, “Never do unto thy neighbour what would be displeasing to thee,” for the principal law of the Mosaic code, as regards our fellow-men, was “Love thy neighbour as thyself;” the rest was but illustration of that Law, which the enquirer had to study by-and-by.

This tale involuntarily comes to my mind at this moment, when I have the honour to read to you a paper on the Talmud. It is very difficult to give, in the short time allotted to me, an entirely comprehensive and exhaustive description of a work consisting of twelve large volumes in folio, containing 5,894 pages. However, I will endeavour to do justice to the task I have undertaken, as far as is consistent with the limited time. Besides which, the subject has been treated in the English language, by the late lamented Emanuel Deutsch, in a manner most creditable to that erudite scholar, whose “sun of life, alas! had set at noon!” I shall now proceed to my subject.

The Talmud is a monument of remote antiquity, a written monument, the essential circle of ideas of which was moving about in the vital channels of a nation for fifteen centuries,

until it gradually chrystalised itself, five centuries later, into that form in which it is now before us, and then, by the fragments of that nation, was spread from the banks of the Tigris to every corner of the world. But it is not old age alone that makes the Talmud an object of interest to every educated and scientific person—there is also a great part of *cultured history* in it. Besides which, it is a veritable treasure for etymology and biblical studies, as well as for the history of all sciences. It might also be of some interest to know that it was not always the promoters of culture who sometimes opposed this ancient monument of literature.

In order to enable you to follow me more easily—the subject not being generally known—I have proposed to answer the following questions:—(1) What is the origin of the Talmud? (2) What are its contents? (3) In what relation is it to the non-Jewish religions? and (4) What influence has it exercised upon the Jews?

To answer the question, “What is the Talmud?” is not an easy matter. It is a work of a peculiar kind. Professor Graetz (Breslau), the distinguished writer of “The history of the Jews,” writes (iv. vol., p. 475):—“The Talmud is not to be considered as an ordinary literary work, having no inner meaning, like many literary productions, but constitutes a singular world which must be judged according to its own laws.” It is therefore difficult to give a precise definition of it, because there is no analogy and proportion to be found. Even the most dowered Talmudist, intimately acquainted as he may be with its system and peculiarities, will hardly be able to give a correct description of it. Still, I should not like to leave this question quite unanswered. Negatively, I must say, the Talmud is neither a compendium nor a code of laws, because it is wanting in all the characteristics which would justify that name in the sense in which these words are generally used. And though the Talmud, in its principal

parts, be an interpretation of the Pentateuch, it cannot be called exactly a commentary. It may be named, most appropriately, *a collection of records and documents*.

Proceeding now to our first question, and being aware that you possess a full knowledge of the Pentateuch, I beg to draw your attention to the difference there is between this part of the Old Testament and the New Testament or Gospel. The latter (according to Jewish views) wanted to found a religion, viz., to regulate the relations of man to God; the Mosaic revelation wanted, besides that, to found also a *State*: no Asiatic despotism, but a lawful State, in which, as the miller of Sansouci did, the citizen could say to his king, "This estate is not for sale by me; it is the inheritance of my forefathers." He who has but a slight knowledge of the Mosaic code will admit that it, indeed, contains the basis for a legislature of this kind, but that, in order to arrange and manage a State according to these principles, a more detailed definition and interpretation are required. Besides which, many *ceremonial laws*, as a matter of practice, necessitated an explanation. According to Talmudic assertion on this point, *which is acknowledged a dogma in Judaism*, the interpretations of the Law were orally communicated to Moses while staying on Mount Sinai forty days for further tradition, and thirteen rules were handed down to him by which the written Law was to be expounded, and the oral tradition to be proved from the text of the written Law. *This oral Law (tradition) and its authentication by the letter of the written Law (Pentateuch), is the chief object of the Talmud.* Although the doctrine of the Sinaitic Tradition is acknowledged and defended also by Christian theologians, I would not ask those out of my pale to accept this dogma as the basis of what I am saying. Since the necessity of an interpretation of the Law cannot be denied, you may take it for granted that a *custom* has formed itself. It is quite immaterial to you what

I personally think of this question. At all events, we must attribute a very great antiquity to the most essential ideas of the Talmud.

Such commentaries on the written Law can be traced already to the biblical books written before the Babylonian Captivity. They are, however, more discernable in the books of Ezra and Nehemiah.

The following fact is worthy of noticing. About 536 before the C.E., a part of the Jews returned to Palestine from the Babylonian exile. They formed a subordinate State to the great empires, but of so miserable a character that, in the year 444, the city of Jerusalem had neither walls nor gates. Still we meet with an accomplished traditional Judaism as far back as the time of *Alexander the Great*. That could not have been done in so short a time in a condition of such internal and external weakness, but must have been in existence already in public life.

The events of the second Jewish empire have likewise something to do with our subject. The country surrendered to Alexander the Great, and then formed the object of strife and battle between the dynasties which divided among themselves the vast dominions left by Alexander, until at last it came under the rule of Syria, whose king, *Antiochus Epiphanes* (or rather Epimanes), provoked the remnant of the Jewish people to war, by his tyranny and cruel fanaticism. It is from that Maccabean war that Judea became an independent State. Soon after that, however, quarrels about the succession to the throne, and civil wars, caused by the Romans, arose, bringing about the fall of the empire and the temple. Owing to the many invasions, numerous foreigners settled in the country, and new social conditions were created. Both these facts, especially the destruction of the temple, necessitated legislative acts—*positive and negative commandments* (Tekanoth and Geseroth)—to issue which, according to

a Mosaic Law, the national representatives (Sanhedrin) were empowered. These laws, in addition, constitute a part of Talmudical matter.

When the Romans, during a war of three years, had laid Judea waste, and were about to direct their battering-rams against the walls of Jerusalem, and three millions of people perished from famine, pestilence, and party-strife, the head of the peace-party, *Rabbi Yochanan ben Zaccai*, caused himself to be carried out of the city as though he was a corpse, in order to entreat the Roman general, *Vespasianus*, to grant him permission to establish a school at *Yabne* or *Yamnia*. The general was graciously inclined; for, pending the audience, the news was reported to him that he was proclaimed Cæsar. He acquiesced with the simple request, not presaging that the success of that school would survive all the Roman prestige. The zeal to study the Law was already great while the temple was still in existence, but it had increased after the fall of the sanctuary. The animal sacrifices were replaced by the study of the Law and prayers, the lost material fatherland was substituted by a spiritual one, and a tie was slung around the nation, which has proved to be an indissoluble one to the present day. In that school and its successors the oral Law was searched through in all directions, and comprised into precise sentences, the foundation of which was shown to be in the Pentateuch.

But we must not think that those teachers of the Law were a stipendiary caste of learned men, though many of them exclusively pursued studies. There were among the *Tena'im* (expositors of the Law)—a Chaldean word derived from "tana," to learn or repeat—many poor artizans, such as boot-makers, smiths, wood-cutters, etc.

Before coming to an important turning-point in the history of the origin of the Talmud, I must premise that the whole mode of teaching and learning was an oral one, it

having been expressly forbidden to write down the oral Law. But when the sufferings of the nation were on the increase, and the existence of the schools was imperilled, the President of the Sanhedrin, R. Yehudah, surnamed "Kadosh," the saint, collected the whole traditional Law and wrote it down.

This work is called *Mishna*, i.e., the second Law, or the repetition of the Law. It is the most ancient part of the Talmud, having been written about 190 C.E. The time is too limited to go into a minute description of the Mishna. Suffice it to say, that it is written in the Hebrew language, and is divided into six parts, or orders, viz., 1. *Seeds*; 2. *Sabbath and Festivals*; 3. *Damages*; 4. *Women*; 5. *Sacrifices*; and 6. *Purifications*.

Each order is subdivided into treatises, chapters, and paragraphs. The Mishna has, therefore, the form of a code, without, however, being so in reality, as there have been taken in also different and often contradictory opinions on single questions. It was not at all the intention of the author of the Mishna to supply a manual which was to make further studies superfluous; he merely wanted to pave the way to them. Indeed, the Mishna required new studies to be pursued. The admission of the contradictory opinions mentioned, and other facts as well, soon necessitated a new manner of teaching, which explained and corroborated the Mishna. This new mode of teaching was soon adopted in two places, viz., *Palestine* and *Mesopotamia*. There, on the banks of the Euphrates down to the Tigris, whence Abraham once had set out to convey and promulgate to mankind the knowledge of an only God, large Hebrew congregations had existed from the time of the Babylonian Captivity. They formed a political commonwealth, ruled by a chief of the rank of a prince; properly speaking, they formed a State within a State. Scholars of Rabbi Yehudah the Saint introduced there the Mishna, and established houses of learning, where the study

of the exposition of the Mishna was carried on with almost a greater zeal than in Palestine. The teachers of that period are called *Amoraïm* (interpreters), and the subject taught has the name of *Gemara* (conclusion).

The activity of the *Amoraïm* in Palestine lasted to the end of the fourth century. About that time the teaching matter was collected which had accumulated in the Palestinian schools from the time of the compilation of the Mishna. This collection, chronologically the second constituent part of the Talmud, exists, as an independent work of itself, by the name of *Jerusalem Talmud*. In the countries on the Euphrates the activity in the work of teaching lasted one more century. But when the wild Huns broke out, bringing about the storms of the incursions (of the nations), which threatened to annihilate everything in existence, the Babylonian expounders of the Law determined to record the results of their mental searchings. The Babylon schools had accumulated a vast amount of matter for teaching, which, as in the case of the Mishna, was unwritten and stored up in memory. *Rabbi Ashi* (352-427), for thirty-two years head of the school at *Sura*, on the Euphrates, commenced gathering and sorting this matter. But, though devoting the greatest part of his life to this gigantic work, he had not the privilege of finishing it, the work having been accomplished by his colleague and successor, *Rabina*, about 500 C.E. This voluminous work is called the *Babylonian Talmud* (Talmud Babli), and is the same which is commonly called *The Talmud*.

Having now very briefly sketched the history of the origin of the Talmud, I proceed to answer the second question, viz., *What are the contents of the Talmud?* That it contains the Mishna as the *text*, and the *Gemara* as its *commentary*, has been said before. But that is not all which the Talmud comprises within it. The *Gemara itself*, again, is divided into two

parts, different in form and contents, viz., the *Halacha* and the *Agada*.

The *Halacha* is that part of the Talmud which elucidates and confirms the Mishna, and thus teaches the *Law*. It is generally written in the form of disputations, approaching in form that which is called the *Socratic* method. There are questions, answers, objections, and refutations. We often find three, four, and even more views opposed to one another in the battle and exchange of opinions.

An almost incredible mental keenness is thereby developed. Grätz, who is supposed not to be a partizan of the Talmud, says on this subject (iv. p. 47): "That which especially characterises the Talmud is the great richness of thought, the keenness of the intellect, and the mental flashes of light that shoot up and again disappear. An infinite source of thoughts and suggestions is deposited in the shaft of the Talmud; not, however, as an accomplished theme which can be appropriated while one is half asleep, but with the fresh appearance of its origin. The Talmud introduces man into the sphere of thought, and its ideas can be prosecuted from their first emotion to that point where they are sometimes raised to a giddy height, even to incomprehensibility." This mental operation is justly called, figuratively speaking, "a crushing of the mountains."

It is generally assumed that the Talmud had interpreted the Mosaic Law in such a manner as to make its practice beset with difficulties. This is totally untrue, as the following instances will prove.

The Mosaic code imposes the penalty of death upon a great many transgressors. Still the Talmud styles a court of justice which had pronounced a sentence of death once in seventy years, a band of murderers. Moreover, the Talmud demands that every offence visited with the penalty of death must be preceded by a warning to the offender in the presence

of witnesses, if he is to be thought guilty of death, and the evidence of these witnesses must be consonant, even in the smallest point. But since this presupposition can scarcely take place once in a thousand years, the carrying out of capital punishment is, according to the Talmud, very nearly a matter of impossibility, the more so since there is prescribed such a severe trial of the witnesses that it is difficult to establish a lawful evidence in criminal matters.

Another instance. The whole world is surprised at and reasoning about the rigour of the Mosaic Law, pronouncing the sentence, "Eye for eye, tooth for tooth, hand for hand, foot for foot," etc. The Talmud knows nothing of it. According to tradition the offender had to pay the injured, for the loss of his limb, a compensation which had to be fixed judicially. Many instances of this kind could be enumerated, would time allow to go on with them.

We now proceed to the *Hagadah*, the second part of the Talmud, which has nothing to do with the first part, or Halacha. The compilers of both the Talmuds have inserted the Hagadah at the side of and between the Halacha, probably for the reason to give the reader a little ease and a pleasant change, after the hard brainwork he had to undergo by the study of the Law. There is also very much Agada matter in special collections attached to the biblical books, which is called *Midrash* (explanation). The Agada, however, does not consist of matter of an equal kind, but is rather, according to form and contents, to be divided into several groups, of which I will name the most important.

The greatest part of the Agada may be characterised as *Homilies*, i.e. sermons, or fragments of such, illustrating the text of the Bible. The biblical word is either interpreted allegorically, or, on account of a deep knowledge of the language, a meaning is found therein which would have escaped the superficial reader of the Bible. Recent research

has, by means of this kind of Agada, achieved great results in the comparison of the Hebrew language with the other Semitic tongues. Besides this, the contents are of so sublime a character, that preachers of all creeds would esteem this part of the Talmud—if it were made generally accessible—a veritable treasure. I will give an instance, which does not require a vast knowledge of Hebrew in order to be understood. In Hosea (xiv. 6), God said, “I will be as the dew unto Israel; he shall grow as the lily;” the Agada interprets these two sentences in such a manner as that they do not appear as co-ordinated, but the one subordinated to the other, so that the second sentence forms the condition of the first, viz., “When will I be as the dew unto Israel,” i.e., “When will I pour out the blessings of mercy unto him?” “When he shall grow as the lily,” i.e., when he will, as the lily, raise himself from earthly sins and passions to heavenly virtue and innocence.

A prominent part of the Agada consists of hundreds of legends. There is not one duty or virtue mentioned in moral philosophy for which we would not find in the Talmud a living pattern. For instance—

“*Hillel hazāken* (the elder one) had invited one of his colleagues to dinner, and asked his wife to prepare a luxurious repast. At the appointed time both friends sat down to table, waiting for the dishes to be served, but nothing was brought on the table. The two sages continued talking of learned matter, and thought but little of eating. However, Hillel said to himself, ‘My wife never comes; she is sure to have a reason for it; it is better not to disturb her.’ The learned conversation went on, the hours passed away, and the food was not served. At last the woman entered, perplexed, and had the dishes served. Her husband affectionately asked her why she had delayed coming, to which she replied, ‘When I was about to bring in the meal, a poor man sorrow-

fully entered the room, saying, "To-day is my wedding-day, but I have no feast wherewith to entertain my guests." I gave him what I had prepared, and I forthwith ordered fresh food. Have I done wrong?' Hillel's eyes brightened with joy at these words, and he said, 'Thou hast acted as a virtuous and God-fearing woman.'"

"*R. Samuel* crossed a river in a barque. On his landing at the shore, a man reached his hand to him to assist him in stepping out. Later on the same man begged for the Rabbi's decision in a law-suit. 'My friend,' said the sage, 'I cannot be your arbitrator, having received a favour at your hands.'"

"*Rab Safra* had a precious stone for sale. Several merchants offered him five gold shekels for it, but he insisted upon ten, and thus the purchase was not made. The Rabbi, however, on considering it, determined to let them have the jewel for the price offered him. The next day the merchants returned at the moment when *Rab Safra* was saying his prayers. 'Sir,' they said, 'let us make the bargain; will you let us have the gem for the price offered you?' The Rabbi did not answer, not allowing himself to be interrupted. 'Be not angry,' they rejoined; 'we will give you two more shekels.' No answer. 'Well, then, you shall have the ten shekels you demanded.' *Rab Safra*, having by this time finished his prayers, said, 'Gentlemen, I have now concluded my devotion; I would not previously interrupt myself. As to the price of the gem, I had already made up my mind to sell it for your offer of yesterday. Give me the five shekels; I cannot take more.'"

The Talmud is also rich in excellent parables. *Herder* made them the subject of his studies, and hereby enriched the German literature; and there is no class-book in the German elementary schools which does not contain some talmudical parables. Allow me to read to you such a parable, as translated by *Herder*.

"SUN AND MOON.

"The word proceeded from the Creator, 'Let there be two lights in the firmament, as queens of the earth, deciders of the rolling time!' He spoke, and it was. The sun rose, the first light. 'As the bridegroom comes out of his chamber, as the strong man rejoices to run a race,' so the sun was there, vested in divine splendour. A wreath of colours encompassed him, the earth rejoiced, the herbs gave forth perfume, and the flowers were adorned. Enviously the other light looked at him, seeing that it was unable to outshine the sun. 'What is the use of two princes sitting on one throne?' Luna said to herself? 'Why should not I be first?' Suddenly her beautiful light disappeared, melting away in the air, and becoming the host of stars. Pale as a corpse, Luna was left standing ashamed before all the heavenly bodies, and crying, 'Have pity on me, Father of all creation, have pity!' And an angel of the Lord said to her, 'Since thou hast begrudged the sun his light, thou shalt in future shine *by his light* only; and when the earth will step before thee, thou shalt be half or totally eclipsed, as at present. But weep no more, child of error. The merciful God has forgiven thy fault, and turned it into blessing. "Go," the Lord said to me, "comfort the repentant. She also shall be queen in her splendour. Let the tears of her penitence be a balm, refreshing all that is panting, and reviving all that is fainting from the scorching beams of the sun."' Luna, comforted, turned herself, and, behold, she was surrounded by that splendour in which she is still shining. Happy and contented, she entered upon her sphere, delighted with cheering up and comforting the weary and fatigued."

A considerable part of the Agada deals with tales of the lives of the patriarchs and prophets, such as are not mentioned in the biblical history. I will give one instance

"MOSES AND THE LAMB.

"Moses was the shepherd of Jethro's flock. One day, whilst feeding his sheep in one of the rare pasture grounds of that desolate country, he saw a lamb going astray and losing itself in the distance. The good herdsman ran after it, but the lamb quickened its pace, running through plains, leaping over ditches, and hastening through valleys. The shepherd ran after it; at last the beast stopped at a river, dipped into the water, and quenched its burning thirst. Moses overtook it, looked at it sadly, and said, 'My dear one, so it was thirst that made thee escape, and I have not noticed it. Poor creature, how tired and weary thou must be! How wilt thou be able to return to thy fellows by thyself!' And Moses took it on his shoulders, and, bending under that burden, went back to the herd. And whilst walking with that load, he heard a voice from heaven, exclaiming, 'Thou, who hast mercy and compassion on the flock belonging to the son of man, thou deservest to be the leader of the flock of God.'"

The Talmud has given expression to practical wisdom in hundreds of sentences and proverbs. A part of them has been made accessible to the learned world by *Buxtorf*, in his "*Florilegium Hebraicum*," and has later on become generally popular. I will quote a few.

"I have learned much from my tutors, more from my colleagues, but most from my pupils."

"He who longs for something out of his reach has often lost that which he has in his hands." "The camel wished to have horns, and lost its ears."

"Weep not there where others are merry, nor be merry where they weep. For above all, my friend, be not of a queer and whimsical nature."

"By three things man can be recognised: by his purse, at the table, and in his temper."

deepness of the river, but on that of its exceedingly great rapidity.' " Here again we have a similar idea.

The sea voyage on which man embarks in life upon the dangerous element, in order to acquire wealth, is the most striking picture of man's striving after affluence. When the greedy of wealth see that some have stepped into the water only to their ankles, and still have grown up to the sky—that is to say, have grown wealthy with but little exertion—they are tempted to act in a like manner. In due time, however, they are, by the voice of reason and conscience, reminded of the carpenter's axe, which is the emblem of working and plodding by the labour of the hands. Many a one has thrown his axe into the ocean of life, *i.e.*, has worked very hard the whole of his life—"seventy years"—without finding repose, not because the water is too deep, *i.e.*, because he has earned little or nothing, but because it is too rapid, which means, because he is seized by greediness of gain; he will rapidly be driven along by this passion and never be contented.

But not all the Talmudic allegories are of so earnest a character. The Rabbis had at times something on their minds which they would have liked to say, but dared not. They spoke in a manner which was understood by the educated, but was a riddle to the plebs. So, for instance, they told us that *Og*, King of Bashan, the giant, tore out high mountains and carried them away on his head; that he consumed so many oxen, venison, and wine every day; and that R. Yohanan once had found the giant's shinbone, which had a length of three miles.

Now, fancy by this giant, the greedy, warlike, and conquering Rome of that period, under the yoke of which the Jews so heavily sighed, and which, in its greediness for territory, passed over the highest mountains and annexed the countries lying behind the same; which, however, though

having grown weaker and enervated, yet seemed to the Rabbi still too powerful.—You will at once find out the *political satire*.

Similar to that is the story of the *lion*, at whose roaring from a distance the eyes and teeth of the Romans had fallen out, and at whose approaching, the Emperor had tumbled down from his throne. The lion is the symbol of the enemy who made his appearance on the frontier of the gigantic empire. To the Rabbi that enemy is the revenger of the cruelties perpetrated on his nation, and the roaring is the lamentation for the destruction of the temple. The enemy is still afar off, yet the Romans lose already their political power. On his approaching, the Emperor is hurled from his throne.

I might easily pass over the reproach which is cast on the Talmud, on account of its *demonology*. As far as I know, the religious writings of other denominations also speak of demons in all earnestness. Jewish practical life is not in the least pervaded by the Talmudic demonology. Judaism has neither a *ritual* nor a *prayer* where there could be traced even a shadow of demonology. *Exorcism* is a thing quite unknown in Judaism.

This circumstance suggests the question whether the Talmud was at all in earnest about the demons, whether we have not to deal here with something quite similar to that we have said of the political satires, and whether by the demons there are not meant *the enemies of the Divine word*. I will leave that in abeyance. But the passage in the Talmud where demons are first spoken of, where they are accused of “causing a crushing in the school,” and where they are said to be the cause of the teachers of the Law “standing on weak legs, having tottering knees, and thread-bare garments”—I say, even this passage corroborates our assumption. It is, furthermore, a question whether many a demonological

passage in the Talmud is not to be taken as an irony upon the demonology of the magicians, amongst whom the Talmudists lived. I will merely hint at this.

There is still another part of the Talmudic matter to mention which is not considered to belong to the Agada, namely, the *scientific* part. The Halachical discussions led to different scientific themes, as astronomy, natural history, anatomy, medicine, geometry, history, etc. The Talmudists very frequently showed that they stood on the height of science, and accepted wisdom wherever they found it. Thus a Talmudist said the opinion of heathen scholars on an astronomical question was more obvious to him than that of the Jewish ones. Another Rabbi was able to boast that the course of the heavenly bodies was as familiar to him as the streets of his native town. It was not a vain-glory on his part, for he was called "the Yarchan," i.e., one who is well acquainted with the moon.

The Talmudists have compiled a calendar combining the *lunar* year with the *solar*. This calendar has not only not shown any defectiveness up to the present day, but will not show it even after thousands of years. It is so plain that a boy well up in sums—when the few principles have been made known to him—is able to compose the Jewish almanach of the festivals. The bones of the human body, as enumerated in the Talmud, are pretty identical with the anatomical science of the present day. The Talmud proves that different sentences of the Mishna are based upon geometrical principles, which may have been known but to a few mathematicians of that age.

Of the many learned Christians testifying to the moral and scientific value of the Talmud, I only mention *Buxtorf*, father and son. The former died 1629, as professor of Hebrew and Chaldee, at the University of Basle, and was succeeded by his son in the professorship. There is no

scholar of Christian parentage who dived into the Talmud as profoundly as these two. They wrote excellent hand-books for the study of the Talmud, as well as extracts therefrom, and, among others, a *Talmudic Dictionary*, which has appeared recently only in a new edition. In his work on "Talmudical and Rabbinical Abbreviations" (p. 233), *Buxtorf*, the father, writes as follows:—"The Talmud is an erudite work, or a great body of learning, compiled by various and *most scholarly* Rabbins. It contains multifarious erudition in all sciences; it teaches the most minute and most perfect civil and canonical law of the Jews, so that the whole nation and the Jewish synagogue are enabled to *live accordingly very happily, and in the most desirable manner*. There are mixed with it manifold narratives which, because mostly containing *profound, secret, and mystical* notions, are *understood but by a few*, and, therefore, by the uninstructed, are rumoured to be the most "absurd fables."

We now come to the *third question*: *In what relation does the Talmud stand to the professors of other creeds?*

According to the Talmud, the Mosaic dispensation is exclusively binding upon the people of Israel. It is not only strictly forbidden to compel anyone to submit himself to that legislation, but it is forcibly enjoined to dissuade those who voluntarily come forward to assume that dispensation; and only if they insist upon it, and it has been firmly established that those who wish to become Israelites are filled with an inward conviction and sincerity, it is allowed to receive them. You will acknowledge here a high degree of religious toleration. The Talmud further maintains that all men—all the descendants of *Noah*, the second father of the human race, called in this sense, in opposition to Israel, *Noachides*—are bound to abide by a legislation which, as proved by the Talmud from the text of the Pentateuch, has been revealed to *Adam* and *Noah*. That legislation comprises *six negative*

commandments and *one positive* commandment. There are forbidden—(1) *Idolatry*; (2) *blasphemy*; (3) *adultery, incest, and every sort of unnatural unchastity*; (4) *murder*; (5) *theft, and (6) the eating of flesh cut from an animal while still alive.* The positive commandment is to create an *administration of justice* according to the laws conformable with reason.

The Israelite is certainly bound to use his influence to induce the whole of mankind to submit to this legislation, and the Israelitish commonwealth had to deny its toleration to all those who shunned that ancient legislation. The assumption of the latter was the condition of concluding peace at any time of war, and the Jewish State had to abstain from waging war with an enemy who had fulfilled that condition. He who kept sacred these obligations had a claim for protection; he belonged to the class of "*the pious who have a share in the future bliss.*" Those non-Jews, however, who would not acknowledge the Noachic precepts, are called, in the Talmud, *Accum* (an abbreviation for the term "worshippers of stars and planets"), and it is the latter we have to deal with now.

You know that for a long period in history, mankind was not so happy as to see these Noachic laws observed. Moreover, you are aware that at the time of the second temple a great many foreigners had settled in the land of Judea, who were for the greatest part *Accum*. If you wish to form an idea of the dangers which, apart from political treason, threatened the Jews on the part of those intruders, hear a few injunctions regarding their (the Jews') intercourse with the *Accum*.

"A Jew must not stay with heathens by himself, they being suspected of committing murder. A Jewess must not be with a heathen by herself, because she is, even in the presence of her husband, exposed to the danger of being violated. A Jew may have his beard shaved by a heathen in

the open air only, the latter being suspected of cutting the Jew's throat. A Jewess must, at her giving birth to a child, not be assisted by a heathen woman without a witness, the latter being liable to strangle the child. A Jew is not allowed to harbour his beast with a heathen, it being feared the latter might make a vicious abuse of it."

You may infer from all that the bottomless pool of vice into which paganism had sunk. You perceive the dreadful degree of brutality against which Judaism, driven by the necessity to defend the life of its followers, had to fight, and you expect a legislature accordingly. But that is not the case, as the following laws and regulations will show:—

(1). *Rabbi Akeeba*, one of the foremost expounders of the Law, said, "The verse of scripture (Lev. xix. 18) 'Love thy neighbour as thyself,' was a chief principle of the Law." *Ben Azai* thereupon remarked, that the passage of the Bible, "*This is the book of the generations of man*" (Genesis v. 1), was the principal commandment of the Law. He meant to say, that the term "thy neighbour" was to be extended to all men, *all the posterity of Adam*.

(2). Wherever we read in the Mosaic Law "*Riacha*" (thy neighbour), it is identical with "*Acheecha*" (thy brother), and so *vice-versa*. It is therefore evident that an encroachment upon the property of a heathen is a sin.

(3). The passage, "Thou shalt rise before a hoary head, and honour the face of an old man" (Lev. xix. 32), is applicable, according to the Talmud, to heathens as well.

(4). "I call heaven and earth for witnesses"—*R. Phineas* said—"that be it a *Jew* or a *heathen*, all will be judged by their deeds, and are capable of being animated by the holy spirit."

(5). He who perceives a heathen sage, is to say the following:—"Blessed art Thou, O Lord, King of the universe; who hast imparted of Thy wisdom to mortal beings."

(6). "All men"—R. Akeeba said,—“even heathens, are especially beloved by God, He having created them in His own image.”

You see from these passages, which could be ten times multiplied, that the Talmud respects the dignity of man, even in the lowest worshipper of the Fetish, extending, as it does, the application of the Mosaic Law to the heathen.

Let us now quote a few positive articles of the Law.

(7). The codes of the Law decide, on the basis of the Talmud, that theft, embezzlement, and every kind of unjust appropriation of that belonging to a heathen are prohibited, and have, in case of occurrence, to be made good (Maimonides on theft, vii. 8). I give the passage verbally. “It is quite immaterial whether one do business with a Jew or an idol worshipper. If he weighs or measures wrongly, he transgresses a Mosaic law, and is bound to indemnify the person for it. It is likewise forbidden to make use of a mistake made by a heathen in calculating, but his attention must be drawn to the mistake, and we must reckon rightly with him. If it is prescribed (Lev. xxv. 50) ‘Thou shalt righteously reckon with the heathen who lives as a stranger with thee in thy land, and therefore *subject* to thee, how much more art thou obliged to do so if thou be a stranger in the heathen’s land, being a subject of his. Besides which it is written (Deut. xxv. 16), ‘For all that do such things, and all that deal unrighteously, are an abomination unto the Lord thy God.’ Thus the deed in itself is regarded by God as an abomination irrespective of the person who is damaged.”

(8). It is interdicted to deceive a heathen, even though he incurs no loss by it. *Mar Samuel* once ordered his servant to pay the fare to a heathen boatman who had taken him across the river. The servant gave the man a fowl which was not killed according to Jewish rite. *Mar Samuel* remonstrated with his servant on this point, although the fowl had the

same value for the heathen as a ritually killed one. "You ought to have acquainted him with the fact," said the sage, "that the fowl is less worth to us than to him." (Treat. Cholin 94, 2.)

(9). According to the Talmud, it is only, then, allowed to lend upon usury to a heathen when the interest is required for one's living, and not otherwise. To the verse, "Who shall abide in Thy tabernacle, O Lord; who shall dwell on Thy holy hill? He that putteth not out his money to usury" (Ps. xv.) Rabbi *Hamnuna* observes, "Not to usury—even to a heathen."

(10). The question, whether the oath of allegiance is to be kept to a heathen is, being a matter of course, not discussed in the Talmud. There is a passage in the Agada to the effect that *Zedekiah*, the last King of Judah, had to endure the severe punishment of being blinded, because he violated the oath made to King *Nebukadnezzar*, his *pagan enemy*. Hereupon Maimonides decides (De juro ii. 1), "It is quite the same whether the man who takes the oath, speaks the formula of the oath himself, or it is spoken to him, and he says 'Amen.'"

(11). These laws, regarding justice to be done to heathens, surely leave nothing to be desired. But they go even further. They enjoin that *active brotherly love* should be extended to heathens. "Heathen poor must not be checked in gleaning at fields belonging to Jews."

In a year of release (where there is nothing growing) poor heathens are to be supported with food, as well as the Jewish poor. "Relief has to be given to indigent heathens, their sick have to be attended to, their dead buried," etc.

Notwithstanding all that, however, I do not deny that many a harsh word is uttered in the Talmud against heathens and heathendom. But is it otherwise to be expected, if we take into account the immorality and maliciousness of the

heathens which I have depicted to you? Moreover, we cannot compare words thought and written two thousand years ago under circumstances which we hardly can realise, thought and written in the language of the East, so easily led away by exaggerating figures of speech, with the cultured state of the present day, and our plain and sober language.

It is not without great reluctance that I now touch upon the relation of the Talmud to Christendom. I would not do so but for the completeness required.

After the just and mild provisions of the Talmud, in reference to the *Accum* (heathens), which I have mentioned, I might pass over in silence the often-made assertion that, in the word of "*Accum*," Christians also are included. But I think it my duty to oppose falsehood wherever I meet it, and I most emphatically declare this assertion to be the grossest lie, the most malignant and impertinent slander, that could be produced. I will substantiate this as far as is possible in the limited time now remaining to me.

(1). The Talmud distinctly declares that nations living outside Palestine are no *Accum*, and that the term "*Meenim*" (heretics), interpreted by slanderous writers to be Christians, is not in the least applicable to them.

(2). The *Mishna*, which was written at the end of the second century, when Christianity already was generally known, but had not yet attained universal rule,—the *Mishna* does not contain *one single word* that could be applied to Christians; whereas, it is well acquainted with the heathen religions. This book, which includes everything that is discussed in the Talmud, is accessible to the whole world, through its having been translated into *Latin* and *German*.

(3). The Jews, living throughout the world amongst Christians, observe not one of the precepts enacted against the *Accum*. They avail themselves of Christian doctors and

midwives; they are taught by Christian masters and teachers, which is all forbidden with regard to the *Accum*. The first law referring to the latter is, that the Jew is not allowed to transact any business with them on, or three days before, their religious festivals. I ask when and where has it occurred that a Jew—even a strictly Talmudical Jew—has observed this injunction towards Christians?

It is therefore evident that, from the standpoint of the Talmud, the Christians are neither theoretically nor practically to be considered as *Accum*. Christianity was established on the documents of the revelation of Judaism, taking from these documents to itself the belief in a God and the whole ethics, and propagating them among heathens. Christianity, which pulled down everywhere the altars of the idols, and has a Divine mission to fulfil, would certainly have been a welcome appearance to the Talmudists, had not circumstances arisen for which the Talmud cannot be held responsible, and which created a strained position. I will briefly dwell on these deplorable circumstances.

The Jews were on an equal footing with the other citizens of the Roman Empire. The Apostle *Paul*, who was considered a Jew by the State, appealed to his Roman citizenship. The Jews not only enjoyed the free practice of their religion, but their heads and ministers of religion also had equal rights with the Christian and Pagan priests; their synagogues and schools enjoyed legal protection, and a desecration of them was punished as sacrilege. They were permitted freely to receive proselytes—a fact which, at that time of religious agitation, very often occurred. Moreover, the Jews living outside Palestine were allowed to raise taxes for their own political and religious community, which was still kept up, and to send them to Palestine. The heads of that community, the Jewish patriarchs, had the official title of *Illustres*, *Spectabiles*, and *Clarissimi*. Lawyers, referring to

various passages of the *Codex Theodosianus*, will find this statement to be correct.

This state of things lasted up to that most memorable epoch in history, the time of Constantine assuming and professing Christianity. There, all at once, Judaism, the mother of Christianity, had become a godless and obnoxious sect, which had to be exterminated from the earth. Civil and religious equality ceased, Jewish sanctuaries were violated with impunity, and the receiving of proselytes, even of their own slaves, was threatened with capital punishment.

On the other hand, all means of force and persuasion were employed to induce the Jews to become apostates, and every attempt at hindering this conversion was most severely punished. The further existence of a central commonwealth was first rendered difficult through all kinds of vexations, then formally abolished, and the taxes were confiscated to the exchequer of the State. He who knows the history of that period will not believe for a moment that these were purely State actions. The Nicæan Council tore the last link which connected both religions together. The Sabbath was definitely removed to Sunday. Easter Feast, hitherto celebrated, according to the Jewish almanach, at the same time as the Jewish *Passover*, was separated from the latter with the avowed intention to widen the gulf, and to have *nothing in common any longer with the hated people of the Jews*. (Eusebius, *De Vitæ Constantini*, ch. 11.)

The father of the church, *Jerome*, who brought about the Latin translation of the Bible known by the name of the *Vulgate*, and sat at the feet of Jewish teachers—a circumstance of which he repeatedly boasted—when suspected of heresy on account of this intercourse with the Jews, did not know a better apology than by writing the following words: "If it be requisite to despise the individuals, as well as the whole people, I detest the Jews with an unspeakable hatred."

(Hyron. adv. Rufinum II.) These words, and hundreds of similar expressions found in Patristic literature, *were written about one hundred and fifty years before the Talmud*. This confession acted like an oracle. It armed, later on, millions of people against the innocent Jews, and invented racks and all sorts of torture for them. These words were subsequently translated into articles of law, of which I will mention but one: "Christian women are prohibited from acting as midwives to Hebrew women, even when in peril of death—the latter being 'lively.'"

In the face of such a hatred, such distress, and such proscription, we must not be surprised at reading, in single editions of the Talmud, mostly to be found in certain public libraries only, a few *Agada passages*, directed against these articles, which were styled, "Christian dogmas." When a Rabbi spoke a bitter word, or, in order to preserve his flock against apostacy, explained to his disciples the dogmas of another creed in his own fashion, and his words were, later on, written down in a distant land like *Persia*, where Christianity did not prevail—would you, in the present time, condemn the Talmud on that account? I think the Jews have suffered much, exceedingly much, and—forgotten it. Christianity now covers those unfounded impeachments and effusions of fanaticism with the mantle of love promulgated by its own religion, and in most of the civilised countries practises the noblest tolerance.

I now proceed to answer the last question, viz., *What influence does the Talmud exercise upon the life of the Jews?*

Whatever may be thought to be the object of Providence in the dispersion of the Jews all over the world, now lasting over eighteen hundred years, whatever future may be in store for those scattered abroad, there is one most remarkable fact with which our mind is impressed, viz., *the internal unity prevailing in this race*. It cannot be denied that the Jew in

Mecca reads his prayers from the same prayer-book, and regulates his life in accordance with the same laws, as the Jew in London, Berlin, or Naples, though the former be all himself an Arab, and the latter an Englishman, German, or Italian—and all that without an external tie, and without any attracting centre. The merit of having preserved that unity is due to the Talmud. It handed down to the widely-spread people a standard shielding them against schism and sectarianism. Without that unity the Jewish people would certainly have succumbed to the torments and persecutions constantly perpetrated upon them.

Now, if we want to form a conclusion from this success, we may well say, "A book which has effected such good results, under circumstances so adverse, can neither be absurd nor immoral."

One more instance will prove that clearly. The mediæval age, which lasted for the Jews till the end of the eighteenth century, has certainly done everything capable of lowering the Jews morally and intellectually to the level almost of the Gipsies. Nevertheless it did not succeed. The Talmud has, in spite of all degradation, fostered in the Jewish nation a degree of morality which, because statistically proved, even Stöcker, Prof. Treitsckke, Henrici, and all those Jew-baiters, cannot deny.

It is hardly a century since legislation has permitted the Jews, not without some restrictions, to enter upon the arena of public aspirations, and for a long time they occupied, in science and art, in the press and legislative bodies, a position which even now, in Germany, has provoked the jealousy of their enemies. The Jews entered this arena right away from the Talmud. *Moses Mendelssohn*, the German Plato, lived and died as a *Talmud Jew*. Would that have been possible if the Talmud was a book of nonsense and superstition? No; that work has produced in the Jews a deep life of thought,

having saved them from lethargy, and kindled within them the light of knowledge, at a time when "thick darkness of ignorance still covered the earth." When, among thousands in Europe, scarcely one could read, when even some princes were hardly able to sign their names, the greatest part of the Jews understood, by the agency of the Talmud, besides the language of their respective countries, Hebrew and Chaldee, and practically exercised the power of thinking, by means of the ingenious Talmudical discussions, as no other studies of logic can bring about. He who knows the value of *formal* education will know how to appreciate that. But the Talmud was also the means of appropriating *real* knowledge to one's self, for it lasted a long time ere it was overreached by science. Animated by the Talmud, those gifted by nature went further, and became the foremost *promoters of science*, poets, philosophers, astronomers, and physicians, of whom Popes availed themselves in spite of canonical inhibition, and who were of great help to emperors and kings, as diplomatic and financial agents.

The mental superiority bestowed by the Talmud upon the Jew of the middle ages inflamed the hatred against this book, which was repeatedly delivered up to the devouring fire, and brought about those lying and slanderous compilations to which I have referred.

I need not dilate upon the influence exercised by the Talmud on the *morality* of the Jews. That truth has long been amply borne out by statistics. But the detractors of the Talmud say, "If the Talmud has exercised such an influence upon the Jews, it is certainly also the cause why the Jews practise commerce more than trade and agriculture. That is the logic of *Alban Stolz*, the famous German inveterate enemy of *Freemasons and Jews*, and his followers, who would rather have wished *Lasker*, the eminent and liberally-minded Jewish member of the German Parliament, to occupy

the elevated and salaried position of a Berlin street-sweeper, than the unpaid one of a representative of a constituency. There are still people who study the mediæval history of jurisprudence, and they know that Jews were *systematically shut out from trade and agriculture*, having been prohibited from acquiring landed property, and being members of a trade's guild. It is the *State*, and not the Talmud, which has made the Jews in that particular what they are. That can easily be seen from that which the Talmud teaches on trade and agriculture, of which I will give a few quotations:—

“Labour is such a great thing as to do honour to him who applies himself to it.”

“Dearth was prevailing for seven years, and never knocked at the door of the artizan.”

“In the same manner as a father is held to teach his son religion, and to endow him with worldly means, he must likewise cause him to learn a *trade*.”

“Tradespeople while at work are not obliged to rise up before a savant.”

“No trade is useless, and none will ever cease. Happy is he whose family carries on a respectable trade; but unhappy is he whose family has a base trade.”

“In society tanners are just as necessary as traders in spices.”

Rabbi *Pappa* said, “It is better to *sow* than to *buy* fruit. Hasten, and purchase land.”

“He who makes himself a servant of the ground will enjoy abundance.”

“At a future period agriculture will be the principal general occupation.”

“Though the field and produce be cheap, agriculture is preferable to commerce, the former offering a safe and permanent income.”

“A learned man said to his colleagues, ‘You must not

come to see me in the months of Tishri and Nissan (September and April), the time of vintage and harvest, in order that I may be able to procure for myself a living for the year.'"

"The king himself is no king without agriculture."

"A man who has no estate does not deserve this name. God said he had given the earth to man."

Rabbi *Samuel* said, "He who visits his field every day finds each time a piece of gold."

Allow me to bring prominently before you one more virtue the Talmud has encouraged in the Jews. It made them true *subjects* and *patriots*. You are all aware of the great sufferings and torments my co-religionists had to endure in Spain. In spite of those sufferings, however, many of them bore for centuries the most harassing fears and anxieties of the Inquisition, and clandestinely remained in the country because they would not part with it.

The banished availed themselves of the Spanish language, as that of conversation, almost up to modern age, and they wrote and sang in it. Napoleon I brought the German Jews freedom and civil right; still the latter joined, in 1813, *en masse*, the files and ranks of the German warriors for liberty and independence. This patriotism has been reared and fostered by the Talmud. "Earthly royalty"—is there maintained—"is a reflex of heavenly kingdom."

"He who perceives a king, even a heathen one, and though he be not *his* king, is to recite the following: "Blessed art thou, O Lord, King of the Universe, who hast imparted from Thy majesty to mortal beings."

"Government decrees nothing to the people without inspiration from Above."

"Pray for the peace and welfare of the government, for were it not in reverence of it, men would swallow each other alive."

I may well maintain that the whole newly-arrayed Anti-

Semetic hatred and agitation now going on in Germany can be traced to the following reason : Because the Jews there, *as one man*, are siding with the party of progress and liberty ; at the same time being dearly attached to the Sovereign and the Royal Family.

In a like manner the Talmud teaches deep attachment to the country and obedience to its laws. " When God scattered Israel amongst the nations," the Talmud observes, " He made him swear never to rebel against the nations in whose midst to live his lot has been cast."

"It is strictly interdicted to evade secretly the taxes due to the State."

" Public laws are to be considered as Divine laws."

The last sentence is of great consequence. If nothing else follows therefrom, but that everything declared by the State to be forbidden and punishable in matters of civil and criminal legislation is binding upon the Israelites like a Divine law, every one has, as far as the conscience of Israelites is concerned, the most perfect guarantee *for property, honour, health, and life*. It is thus evident that all the attacks made upon the Talmud in this respect must necessarily crumble down to ashes. There is another guarantee offered by Talmudic lore, which is deeply impressed upon every Jewish schoolboy. It forbids the Israelite every action, by means of which the name of Israel and his faith might be put to contempt. But as man is as little able to calculate the consequences of his doings as to take back a stone thrown by him, the Israelite is prohibited from committing a reprehensible deed, either openly or secretly.

"Deal truly and honestly, especially with non-Jews," the Talmud enjoins, "in order that the name of Israel and his Law be not defiled." "He who deals wrongly with a non-Jew desecrates the name of God, whose Law Israel obeys ; it is a sin which can be expiated by death only."

Simon ben Shetach (circa 80 bef. C.E.) lived at a time when the then independent second Jewish State was in a flourishing condition. Though being related with the reigning Maccabean kings, and President of the Sanhedrin, he still lived in poverty, earning his livelihood by dealing in flax. In order to make this trade easier to him, his disciples bought for him a mule, with harness, of a heathen. Arriving at his house with the mule purchased, they said to him, "Rabbi, henceforward thou wilt no longer have to trouble thyself with trading, for we have found sewn in the saddle of the mule a most valuable precious stone, which makes thee a rich man now." "Does the seller know of that?" the Rabbi asked. When the scholars answered in the negative, he betook himself to the latter, returning him the gem. Later on, there was a discussion in a Jewish college as to whether Simon ben Shetach was legally obliged to restore the stone or not. One Rabbi asserted, Simon ben Shetach has never gone into this question; he would have restored the gem even if the decision of the case had been in his favour, inasmuch as he preferred the fact of the heathen having exclaimed, "Blessed be the Lord of Israel"—to all the wealth of the earth. Now, if an Israelite commits a wrong deed, he commits it on his own responsibility before God; in the Talmud he finds no support whatever for hushing up his conscience.

I now come to the *conclusion*. I did not want to inspire you with the Talmud. Our age is not made for to give subjects of this kind more than a passing interest. It was different at the beginning of the sixteenth century. Then, one of the best and most learned Germans, *Johann Reuchlin*, staked his health, wealth, and, what was still more at that time, his reputation as an orthodox Christian, upon the Talmud.

The highly celebrated *Ulrich von Hutten* thought it an

honour to devote his pen to the service of the Talmud. Then the latter gave rise to one of the most interesting productions of the German mind, the well-known "Dunkel-männerbriefe" (letters of obscure men), which exercised a mighty influence upon the development of the then floating questions, strongly promoting a celebrated historical event. In these days, however, there are for great men other objects of battle—objects which press with vehemence. I conclude with the following *resumé* :—

The Talmud contains, indeed, many a dark and, if taken literally, seemingly offensive passage. The latter, however, cannot only be *explained*, but can also, taking into consideration the time in and the circumstances under which they were thought and written, be amply justified.

Even those who, refuting this explanation and justification, absolutely want to find fault with the Talmud, must agree that every little shade is outshone by a thousand beams of light. It is, therefore, that this book, of which in these days among a thousand Jews scarcely one has any knowledge, except by name, may confidently be left to the Rabbins, science, and history, to which it belongs.

The Talmud—this great work cannot be better characterised than by the words of Ecclesiastes (xii. 11). "The words of the wise are as goads, and as nails fastened by the masters of assemblies, which are given from *one* shepherd." May it be reserved to this work to bless the aspirations of the Israel, in the present sunny days, and to co-operate in the brotherly bond of love with the professors of the younger creed in the great work of promoting morality in the human race, and contributing to the attainment of the great aim set to mankind by the Divine Creator.

FALSTAFF AND HIS FOLLOWERS: A SHAKESPEAREAN INQUIRY.

By J. A. PICTON, F.S.A.

IN studying the works of our immortal dramatist we feel at a loss to determine which element more displays his genius, the tragic or the comic. The depth of pathos and grandeur in *Macbeth*, *Lear* and *Othello*, the subtle workings of a diseased intellect in *Hamlet*, the stately march of *Coriolanus* and *Julius Cæsar*, fill our minds with admiration, and stir up our deepest feeling, whilst the absurdities of *Dogberry* and *Verges*, the keen wit of the clown in the *Twelfth Night*, the quaint philosophy of *Touchstone*, and the madcap orgies of *Falstaff* and the *Prince*, not only linger in our memories with the pleasant flavour of keen enjoyment, but have served for ages to give point and expression to many of the lighter aspects of human life. This enjoyment seems to have been largely partaken of by the author himself, who appears to have revelled in the wonderful creations of the quaint and humorous which his fancy depicted and his imagination bodied forth. The most sustained and popular of these creations is undoubtedly that of *Falstaff*, carried through three of the plays and part of a fourth with a vigour and consistency which never flags. The humour is broad, and occasionally coarse, but there runs through all a subtle wit and a keen appreciation of human motives and feelings, distorted by selfishness, and brought out under ludicrous circumstances, which evinces its truth to nature, and illustrates the workings of the human heart.

The whole conception of *Falstaff's* character is daring in the extreme, and one which in any other hands but those of

the highest genius would have been utterly repulsive. He is represented as false, dishonest, licentious, and selfish, and to a certain extent a coward, yet the display he makes of readiness, sagacity, presence of mind, the richest wit and humour, and even his unrestrained impudence, irresistibly enlist our sympathies, and in spite of ourselves excite a kindly interest in the sallies of the witty vagabond. We naturally wish to obtain a general conception of his character as we would that of a personage in real life, by following him from the beginning to the end of his career, so far as it is unfolded for us ; but here arises a difficulty. Falstaff, in the historical play, is the same roystering wild scapegrace as he is represented in the *Merry Wives*, under different circumstances. We cannot for a moment doubt that the same individual is presented to us in the comedy as in the histories. We therefore naturally ask what is the relation between the two series of plays ? How do they synchronise in point of time ? Is it possible consistently to harmonise the action depicted in each ? And which was the earliest conception in the mind of the dramatist ? To answer as far as it is practicable these questions is the object of the present paper. The subject is not free from difficulties, but the inquiry is full of interest.

Let us first examine what evidence exists as to the respective dates of the production of the plays in question.

The quarto editions were issued as follows :—

Henry IV, Part 1, in 1598.

Do. Part 2, in 1600.

Henry V, in 1600.

Merry Wives of Windsor, in 1602.

These, with the other dramas, were collected in the folio of 1623, with the text as now accepted.

The natural inference would be that the plays were composed in the order here laid down. Malone records a tradition current in his time, that Queen Elizabeth was so amused by

the character of Falstaff in the historical plays, that she requested the author to exhibit the witty knight in love. This tradition, like many others, has expanded in its progress. It was originated by Sir Wm. Davenant, from whom it came to Dryden, then to Dennis, by whom it was stated in an introduction to an adaptation of the *Merry Wives*, published in 1702, that "this comedy was written at the command of Queen Elizabeth, and by her direction, and she was so eager to see it acted, that she commanded it to be finished in fourteen days, and was afterwards very well pleased at the representation." Not a word is here said as to the character of Falstaff being developed from the historical plays, nor is Falstaff mentioned at all. But for the fact of the consecutive dates of issue already mentioned, it might just as well be assumed that the Falstaff of *Henry IV* was a development of the same character as presented in the comedy. Let us, then, enquire how the alleged dates affect the question.

Shakespeare died in 1616. In 1623 the collected plays were published in folio (the celebrated first folio), with a preface by the editors, which states to the reader, as a reason for the issue, that "before, you were abated with divers stolen and surreptitious copies maimed and deformed by the frauds and stealths of injurious impostors that exposed them." This is strong language, and could only apply to cases in which the text had been largely corrupted and tampered with. The first nine plays had been previously issued in quarto between the years 1597 and 1600, with the text as it stands in the folio, with the exception of a few verbal corrections. Included in these are the two parts of *King Henry IV*. It is clear, therefore, that to these the complaint in the preface would not apply. It is to be remarked also that in seven out of these nine plays the publishers of the quarto and folio editions were the same. In relation to the *Merry Wives*, we find a very different state of things. The first quarto edition was piratically published in

1602, by Arthur Johnson, whose name does not elsewhere appear. It is extremely imperfect and incomplete in the text, and has all the marks of a hasty sketch. To this, therefore, the epithet of "a maimed and deformed copy" would exactly apply. The first sketch of the play must, then, have been written some time before the publication of the pirated edition of 1602; how long before, we have no external evidence to guide us; there are, however, a few incidents in the play itself which may assist in coming to a conclusion. In 1592, a visit was paid to England by a Duke of Würtemberg and suite, of which a record exists in a volume printed at Tübingen, in 1602. Amongst other places they visited Windsor. In the arbitrary manner of that period, the German Duke was furnished by Lord Howard with a pass, addressed to all Justices, Mayors, and Bailiffs, requiring them to see him furnished with post-horses, for which he was to pay nothing. Evident allusion is made to this visit in the play. In Act iv, sc. 3, Bardolph brings a message to the host of the Garter.

"Sir, the Germans desire to have three of your horses: the duke himself will be to-morrow at court, and they are going to meet him." From what passes, it is evident that the Germans had been living at free quarters at the inn. The host says, "They shall have my horses; but I'll make them pay; I'll sauce them."

In the subsequent scene, Bardolph brings tidings that the Germans have run off with the horses; he says "they threw me off, from behind one of them, in a slough of mire: and set spurs and away, like three German devils, three Doctor Faustuses."

Now, if the play was written at the time, or soon after this occurrence, it gives a little local colouring, which is very natural, but if it was penned eight or ten years after, the circumstances would have been forgotten, or not worth alluding to.

It is clear, then, that the edition of 1602 was an unauthorised and imperfect issue of a drama already in existence, but which had not been published by its author, and which was disowned by the editors of the folio of 1623. If we assume for a moment that the original sketch of the play as it was first acted had been pirated, and that subsequently it was extended and revised by the author, it would appear natural that allusions should be made to circumstances which had occurred after the first issue. In several instances we find such to be the case. In the *Merry Wives*, Act i, sc. 3, in the original sketch, Falstaff, speaking of the two ladies, says, "They shall be exchequers to me, and I'll be cheater to them both. They shall be my East and West Indies." In the revised edition another passage is introduced. Speaking of Page's wife, Falstaff says, "She bears the purse too. She is a region in Guiana, all gold and bounty." Now, Sir Walter Raleigh's expedition to Guiana sailed in 1595 and returned in 1596. It seems a fair inference that this allusion to Guiana was penned after the return of the expedition. As it is not in the original sketch, the inference is equally fair that this sketch was written before the expedition, and consequently before 1596.

Again, in the last act, where the fairy revels take place, in the original sketch the fairies have no queen, whilst in the revised play the fairy queen is introduced three times. Now, Spenser's "*Fairy Queen*" was published in 1596, and attracted great attention. What, then, so natural as that in the revision of the comedy, Shakespeare, alive to every incident which could heighten the effect, should have introduced the allusion. If that be so, then the play in its first shape must have been written before 1596.

But again, in the revised play, in the last scene, Falstaff says, "Let the sky rain potatoes, hail kissing comfits, and snow eringoes." These words are not in the original sketch,

and are taken from Lodge's "Devils Incarnate," which was published in 1596. It is only reasonable to infer that the sketch was written before that date.

So far, then, as external evidence goes, the probabilities are strong that the original draft of the *Merry Wives* preceded the historical plays; that it was pirated by Arthur Johnson in 1602, afterwards revised and extended by the author, and first included in its complete state in the folio of 1623.

Let us now look at the internal evidence of the plays themselves. We must surely concede to the genius of Shakespeare a general and consistent conception of the characters of his own creation; that they presented to the eye of his mind that innate energy and force which impart to their actions and speech such an amount of naturalness and realism. If so, then there must be some mode of harmonising and bringing into a consistent whole the diversified action of the *dramatis personæ* in the four plays now under consideration.

I know no better way of doing this than starting with the assumption that the characters were real personages, of whom the only knowledge we possess is contained in the record of their sayings and doings in the 1st and 2nd parts of *King Henry IV*, the play of *Henry V*, and the comedy of the *Merry Wives of Windsor*. In this way I think we have the most likely means of gaining, as near as may be, the standpoint of the author.

First, then, I think it will scarcely be doubted that Falstaff is the same man throughout; that the only difference in his character arises from the different positions in which he is placed, and the various persons with whom he is brought into contact. From his first appearance in the historical plays in the 1st act of *Henry IV*, to the description of his decease in the 2nd act of *Henry V*, we never lose sight of him. All his movements are recorded with the utmost precision.

The first scene in which we meet with him is laid in a room in the king's palace, where he professes himself to the prince as one of the "gentlemen of the shade; minions of the moon," or, in plain English, a highwayman.

The Boar's Head Tavern afterwards becomes the rendez-vous. In Act iii, sc. 3, the prince procures him a charge of foot soldiers, and he goes to the wars as captain, receiving three hundred and odd pounds for obtaining recruits, with whom he is ashamed to march through Coventry. He is present at the battle of Shrewsbury, where he distinguishes himself in the well-known aspects of his character.

He then returns to London, where some time intervenes between the incidents of the 1st and 2nd parts of King Henry IV., when the action again commences, the scene with the Lord Chief Justice takes place, and Falstaff's subsequent arrest at the suit of Mrs. Quickly. The army is in motion to suppress the rising of Northumberland and Glendower, and Falstaff is again commissioned to obtain recruits. The Chief Justice says to him, "I hear you are going with Lord John of Lancaster against the Archbishop and the Earl of Northumberland" (Act i. 2), and in a subsequent scene he says, "Sir John, you loiter here too long, being you are to take soldiers up in counties as you go." (Act ii. 1.)

A subsequent revel at the Boar's Head is cut short by Peto, in hot haste, bringing the news:—

—"As I came along

I met and overtook a dozen Captains,
Bare-headed, swearing, knocking at the taverns,
And asking every one for Sir John Falstaff."

(Act ii. 4.)

Bardolph then rushes in:—

"You must away to Court, Sir, presently.
A dozen Captains stay at door for you."

(Act ii. 4.)

Falstaff proceeds on his expedition, and we next meet with him at Justice Shallow's, in Gloucestershire, where he selects his ragged squad of recruits, and then proceeds to join the army in Yorkshire, and is chidden for his late arrival. After the surrender of the rebels, he returns to Justice Shallow's, where he is merrily entertained, and borrows a thousand pounds from his host.

In the midst of their revels the news arrives of the death of the king and the accession of the hitherto madcap prince. Falstaff, with his followers, hurries off to London, accompanied by Justice Shallow, full of great expectations, which are nipped in the bud by the cold reception and the committal of Sir John to the Fleet.

In Henry V, Act ii, come the closing scenes of Falstaff's career. He is prostrated with what Mrs. Quickly calls "a burning quotidian tertian," and his friends are summoned to his bedside. In Act ii. 3, the hostess describes his passing away in a very touching manner.

The history of the knight, as thus summarised, is connected and continuous from first to last.

Let us now turn to the Merry Wives of Windsor.

I assume the identity of Falstaff and his followers throughout all the plays. The transactions, then, here recorded must have taken place either before the time of the historical plays, during some interval within that period, or at a date subsequent to the histories. Now, they could not have taken place after Henry V, for Falstaff's death is there recorded. Within the period contained in the histories there is no interval for an episode at all; the course of the story is never interrupted. There is, then, no other conclusion except that the events in the Merry Wives happened before those of the historical plays. Let us see what evidence we can find in the plays themselves.

First, as to Falstaff's age. In the histories, Falstaff's

advanced age is frequently alluded to. In the scene at Justice Shallow's house, in Gloucestershire ⁽¹⁾ reference is made to transactions at Clement's Inn, fifty-five years before, when it is said Falstaff was a boy. Assuming him to have been fifteen years old at the earlier period, he must have been seventy at least when the guest of the Justice. In Henry II, Pt. 2, Act ii. 4, Doll Tear-sheet asks Falstaff, "When wilt thou leave fighting and begin to patch up thine old body for heaven?" Falstaff replies, "I am old, I am old." In the scene with the Lord Chief Justice, the latter says, "Have you not a moist eye? a dry hand? a yellow cheek? a white beard? a decreasing leg? an increasing belly? Is not your voice broken? your wind short? your chin double? your wit single? and every part about you blasted with antiquity?" ⁽²⁾ In the last scene, when the prince, now king, casts him off, he says:—

"I know thee not, old man: fall to thy prayers;
How ill white hairs become a fool and jester!
I long have dreamed of such a kind of man,
So surfeit-swelled, so old, and so profane." ()

Turn we now to the comedy. In the opening scene, Justice Shallow accuses Falstaff, "Knight, you have beaten my men, killed my deer, and broke open my lodge."⁽⁴⁾ Such roystering conduct is hardly the act of a septuagenarian. The robbery at Gadshill, may be referred to as a corresponding transaction; but there the fat knight is described as quite incapable from age and infirmity. He says, "If I travel but four foot by the square further afoot, I shall break my wind."
. . . "Eight yards of uneven ground is threescore and ten

(1) Henry IV, Pt. 2, Act iii. 2.

(2) Do. Act i. 2.

(3) Do. Act v. 5.

(4) Merry Wives, Act i. 1.

miles afoot with me.”⁽¹⁾ It is obvious that in the comedy Falstaff must have been a younger and more active man. Again, some time must have elapsed between the scenes of the comedy and the visit of Falstaff to Shallow’s house in the histories, for the animosity had subsided, and the Justice welcomes his guest in the most cordial manner.

Doubtless, in several passages in the comedy, Falstaff is referred to as an old man. In his letter to Mrs. Page, he says, “You are not young, no more am I: go to, then, there’s sympathy.”⁽²⁾ Again, “Sayst thou so, old Jack? go thy ways; I’ll make more of thy old body than I have done.”⁽³⁾ These expressions are merely comparative, and do not imply absolute old age. It is true, in the closing scene, Sir John is described as “old, cold, withered, and of intolerable entrails”⁽⁴⁾; but this is the spiteful remark of the enraged husband, Page, and is by no means echoed by the two ladies. Indeed, in order to render the comedy at all *vraisemblable*, it is necessary that Falstaff should be represented, though declining in years, as still hale and vigorous; very different from the huge mountain of flesh depicted in the histories.

There is one passage which may seem to militate against this view. Justice Shallow says, in conversation with Sir Hugh Evans, “I have lived fourscore years and upwards.”⁽⁵⁾ Now, if we are to allow any extended period of time between the events in the comedy and those of the histories, this would make the Justice, at the time of Falstaff’s visit, almost a nonagenarian. This may be a slip in the dramatist’s consistency, but consistency would be very much more outraged by the opposite view.

It is remarkable that there is no special reference in the one set of plays to the events of the other. On the theory that the comedy preceded the histories, this is easily expli-

(1) Henry IV, Pt. 1, Act ii. 2. (2) Merry Wives, Act ii. 1. (3) Merry Wives, Act ii. 2. (4) Merry Wives, Act v. 6. (5) Merry Wives, Act iii. 2.

cable ; there was nothing in the Windsor episode which could in any way connect itself with the subsequent adventures of Falstaff ; but, on the contrary theory, the utter absence of any reference in the comedy to the stirring events in the histories would be utterly unaccountable. The only allusion is in the closing scene of the fourth act, where after the beating he has undergone in the disguise of the old woman of Brentford, Falstaff says to himself, " If it should come to the ear of the Court how I have been transformed . . . and cudgelled, they would melt me out of my fat, drop by drop, and liquor fishermen's boots with me ; I warrant they would whip me with their fine wits till I were as crestfallen as a dried pear." ⁽¹⁾ This indicates that Falstaff had already been about the Court, but there is nothing of a special reference to any intimacy.

Another allusion occurs in a conversation between Master Page and the host of the Garter, in reference to Fenton's courtship of Anne Page. Her father says, " The gentleman is of no having ; he kept company with the wild prince and Poins ; he is of too high a region ; he knows too much." ⁽²⁾ Now, if Falstaff had already been the boon companion of the Prince and his hangers-on, it would be utterly incredible that Fenton, who is here charged with being one of the circle, should be in immediate intercourse with the fat knight without any indication whatever of the connexion. It may be said that in the play they never meet until the last scene, but they are lodged in the same inn, and in frequent conversation with the garrulous host and with the go-between Mrs. Quickly.

So much for the fat knight himself. Let us now turn to his followers, and trace their history through the four plays. Bardolph and Mrs. Quickly appear in the whole of them. Pistol and the Page are found in three. Poins and Peto are only introduced in the two parts of Henry IV. Nym appears in the Merry Wives and in Henry V. The host is only intro-

(1) Act iv. 6.

(2) Act iii. 4.

duced personally in the comedy, but is alluded to in the other plays, and Gadshill is only found in the first part of Henry IV.

We will first take the host and Mrs. Quickly, who are connected together. In the *Merry Wives*, the host takes a very prominent part, and seems to be a jovial rollicking sort of character, but at the same time looking well after the main chance. There is no evidence of his being at that time married.

When we are first introduced to Mrs. Quickly, she is housekeeper to Dr. Caius, and apparently quite familiar with the Garter Inn, where she meets with Falstaff for the first time. She is then unmarried, for when the knight accosts her, "Good morrow, good wife," she replies, "Not so, an't please your worship."⁽¹⁾ The acquaintance then formed, runs through the entire series of plays. No one who reads them can for a moment doubt the identity of Mrs. Quickly throughout. She is the link which connects the whole of Falstaff's history. She is the same loose character and unprincipled intriguer from first to last. Her phraseology is also much the same, except in the fairy scene in the comedy, where she is evidently reciting a part committed to memory.

In the first part of Henry IV, we find her installed as landlady of the Boar's Head, Eastcheap. She is now married, for Prince Henry asks her, "What say'st thou, Mrs. Quickly? how does thy husband? I love him well; he is an honest man."⁽²⁾

In the same scene, when Falstaff and the hostess quarrel, he exclaims, "Go, you thing, go;" she replies, "I am no thing to thank Heaven on; I am an honest man's wife." When afterwards a reconciliation takes place, the knight addresses her with—"Hostess, I forgive thee; love thy husband, look to thy servants, cherish thy guests."

(1) *Merry Wives*, Act ii. 2.

(2) *Henry IV*, Pt. 1, iii. 3.

The host, I have already remarked, does not appear in person, except once, and then only for a moment.⁽¹⁾ Since Mrs. Quickly has removed from Windsor, would it be taking too much liberty to suppose that mine host of the Garter, disgusted with the cosenage of which he so loudly complained, had removed to London, taken the Boar's Head, and installed Mrs. Quickly as his better half? Whether this were so or not, it does not affect the history. It is the same Mrs. Quickly who is the heroine in both cases. In the second part of Henry IV, Mrs. Quickly appears as a widow. Her intimacy with Falstaff had commenced before her husband's decease, for she says in the scene already alluded to—

"I know you Sir John; you owe me money, Sir John; and now you pick a quarrel to beguile me of it."

Since her husband's death, Falstaff had promised her marriage. She reminds him reproachfully—"Thou didst swear to me upon a parcel-gilt goblet, sitting in my Dolphin chamber, at the round table, by a sea-coal fire, on Wednesday in Whitsun week, when the prince broke thy head, for liking his father to a singing man of Windsor, thou didst swear to me then, as I was washing thy wound, to marry me, and make me my lady thy wife. Canst thou deny it? and didst not thou . . . desire me to be no more so familiarity with such poor people; saying that ere long they should call me madam? and didst thou not kiss me, and bid me fetch thee thirty shillings? I put thee now to thy book oath; deny it if thou canst."⁽²⁾

Falstaff, not keeping his promise, and being deeply in debt, she has him arrested by Fang and Snare. He manages, however, by means of wheedling and promises, not only to escape from the bailiffs, but to extort further twenty nobles from her.

(¹) Henry IV, Pt. 1, ii. 4.

(²) Henry IV, Pt. 2, ii. 1.

In a subsequent scene, in a revel at the Boar's Head, ancient Pistol and Mrs. Quickly have a violent quarrel. When he is announced, she exclaims, "Shut the door ; there comes no swaggerers here ; I have not lived all this while to have swaggering now." Falstaff tries to pacify her, but she persists—"Pray you, pacify yourself, Sir John ; your ancient swaggerer comes not in my doors." Pistol, however, forces his way in, and after some fustian speeches, he is finally driven out by Falstaff.⁽¹⁾

In the closing scene of the same play, Mrs. Quickly is arrested by the beadles, on the charge of keeping a disorderly house.

During the short interval between this event and the second act of Henry V, she becomes reconciled to Pistol, and has married him. In an interview in Eastcheap, Bardolph says, "Here comes ancient Pistol and his wife ; how now mine host Pistol ?" Pistol resents the title—"Base tike, call'st thou me host ?

Now by this hand I swear I scorn the term,
Nor shall my Nell keep lodgers."⁽²⁾

Falstaff is lying on his death-bed in her house, and sends for the hostess.

In a subsequent scene occurs Mrs. Quickly's quaint but melancholy description of the poor knight's end :—

"After I saw him fumble with the sheets, and play with flowers, and smile upon his fingers' ends, I knew there was but one way ; for his nose was as sharp as a pen, and 'a babbled of green fields.'"⁽³⁾

When Pistol afterwards goes to the wars, he leaves his wife in charge :—

—"My love, give me thy lips,
Look to my chattels and my movables :
Let senses rule ; the word is 'Pitch and pay ;'
Trust none ;

(¹) Henry IV, Pt. 2, ii. 4. (²) Henry V, ii. 1. (³) Henry V, ii. 3.

For oaths are straws, men's faiths are wafer-cakes,
 And hold-fast is the only dog, my duck :
 Therefore, *caveto* be thy counsellor." (1)

After the expedition to France has terminated in Pistol's humiliation in eating the leek, news reaches him of his wife's decease :—

"News have I that my Nell is dead i' the spital;
 And there my rendezvous is quite cut off." (2)

And so terminates Mrs. Quickly's eventful history.

Let us now turn to the parallel biography of ancient Pistol himself. There is no one of the comic characters in Shakespeare's plays with a more marked idiosyncrasy and more amusing development than this. The combination of impudent braggadocio, ranting fustian, arrant cowardice, with occasional redeeming features, is hit off with a masterly hand. In the midst of his absurd rhodomontade, we cannot help occasionally sympathising with the workings of human nature within.

The identity of the man in the comedy and the histories is too marked to be for a moment mistaken. There are the same "red-lattice phrases and bold beating oaths" in both, and Pistol's relations with Falstaff, and with his followers, are the same throughout.

In the first scene, in which Pistol is introduced, Falstaff gives him a letter of assignation to carry to Mrs. Ford, but Pistol refuses, as inconsistent with his honour as a soldier:—

"Shall I, sir, Pandarus of Troy become,
 And by my side wear steel? then Lucifer take all!" (3)

Pistol, along with his two fellows, Bardolph and Nym, are then discharged by Falstaff:—

"Rogues, hence, avaunt! vanish like hail-stones, go;
 Trudge, plod away i' the hoof, seek shelter, pack."

(1) Henry V, ii. 3. (2) Ibid, v. 1. (3) Merry Wives, i. 3.

After Falstaff has departed, Pistol indulges in strong expressions against his quondam master:—

“Let vultures gripe thy guts! for *gourd* and *fullam* holds,
And *high* and *low* beguile the rich and poor; (¹)
Tester I'll have in pouch, when thou shalt lack,
Base Phrygian Turk!”

Pistol threatens to betray Falstaff's designs to Page, but really gives the information to Ford. He says—

“Sir John affects thy wife.
He wooes both high and low, both rich and poor,
Both young and old, one with another, Ford;
He loves thy gally-mawfry; Ford, perpend.” (²)

In the next scene he tries to borrow money from Falstaff, and, on his refusal, utters the memorable resolution—

“Why, then the world's mine oyster,
Which I with sword will open.”

The knight upbraids him sarcastically with refusing to do his bidding: “You'll not bear a letter for me, you rogue! You stand upon your honour! Why, thou unconfinable baseness, it is as much as I can do to keep the terms of my honour precise. I, I, I myself sometimes, leaving the fear of heaven on the left hand, am fain to shuffle, to hedge, and to lurch; and yet you, rogue, will ensconce your rags, your cat-a-mountain looks, under the shelter of your honour! You will not do it, you!”

Pistol replies, “I do relent. What would thou more of man?” He does not again appear until the last scene, where he utters a few lines in marshalling the fairies who are to play their tricks on Falstaff in disguise.

In King Henry IV, Part 1, Pistol does not appear at all, but in the second part he is rather a conspicuous character.

(¹) *Gourd*, *fullam*, *high*, and *low* were cant terms for false dice.

(²) *Merry Wives*, ii. 1.

In Act ii, scene 4, at the Boar's Head Tavern, Pistol is announced by one of the drawers or tapsters. Mrs. Quickly, the hostess, as already stated, violently opposes his entrance, but his part is taken by Falstaff. He says, "Dost thou hear, hostess; it is mine ancient." In reply to some provoking observations of the lady, he says, "He's no swaggerer, hostess, a tame cheater—call him up, drawer." When he enters, Falstaff salutes him—"Welcome, ancient Pistol. Here Pistol, I charge you with a cup of sack." The hostess, however, will not be pacified, and finally the ancient is ejected.

He does not, like Bardolph, accompany Falstaff to the wars, but he is still a sort of agent; for it is he who, at Justice Shallow's house in Gloucestershire, bursts in with the news that the king is dead:—

"Sir John, I am thy Pistol and thy friend,
And helter-skelter have I rode to thee;
And tidings do I bring, and lucky joys,
And golden times, and happy views of price."

Again:—

"Sir John, thy tender lambkin now is king,
Harry the Fifth's the man. I speak the truth;
When Pistol lies, do this, and fig me, like
The bragging Spaniard." (1)

In the last scene of the play, Pistol stands with Falstaff, Justice Shallow, and Bardolph, to welcome the new king. After the severe rebuff which the king administers, Pistol philosophically consoles himself with the adage he so frequently quotes:—

"Si fortuna me tormenta, spero me contenta."

In the interval between the plays of Henry IV and V, Pistol has married the hostess, and become landlord of the

(1) Henry IV, Part 2, v. 4.

Boar's Head. After Falstaff's death, Pistol, Bardolph, and Nym go with the army to France, and are present at the siege of Harfleur. Pistol continues to mouth out his fustian, but is described, by the boy, as having "a killing tongue, and a quiet sword, by the means whereof he breaks words, and keeps whole weapons." At the battle of Agincourt, he takes prisoner a French soldier, and ransoms him for a hundred crowns. The feud with honest Fluellen, and Pistol's humiliation in being compelled to eat the leek, are as familiar as household words. After his disgrace, he thus soliloquises, on hearing of his wife's death :—

"Old do I wax; and from my weary limbs
Honour is cudgell'd
To England will I steal, and there I'll steal;
And patches will I get unto these cudgell'd scars,
And swear I got them in the Gallia wars." (¹)

And thus ancient Pistol disappears from the stage.

Bardolph is introduced into all the four Falstaff plays. In the first scene of the *Merry Wives*, Slender complains to the knight of the "coney-catching rascals, Bardolph, Nym, and Pistol," having made him drunk, and afterwards picked his pocket.

Bardolph in the comedy and the histories is the same man. His fiery visage and his peculiar phraseology are constantly alluded to as characteristics. Slender says, in reference to his robbery, "By this hat, he in the red face had it." Falstaff accosts Bardolph, "What say you, Scarlet and John?" Throughout the whole plays he is made a butt for his blotched and pimpled face. Falstaff says, "Thou art our admiral; thou bearest the lantern in the poop, but 'tis in the nose of thee; thou art the knight of the burning lamp," and so on throughout.

(¹) Henry V, v. 2.

When Bardolph is discharged by Falstaff ⁽¹⁾, he is engaged by the host of the Garter as tapster or drawer. The host says, "I will entertain Bardolph; he shall draw, he shall tap—let him follow; let me see thee froth and live." During the rest of the play he acts simply in the capacity of tapster. In the historical plays he emerges again as one of Falstaff's followers. The probability is that the host of the Garter had transferred his establishment to London, and was the vintner of the Boar's Head. Bardolph was with Falstaff at the robbery on Gadshill, and subsequently when the sheriff made an attempt to arrest the thieves.

He then goes with Falstaff to the campaign at Shrewsbury, and is sent on to Coventry, and we hear no more of him in that play.

In the second part of Henry IV, Bardolph is with Falstaff when he is arrested by the bailiffs, and afterwards is exposed to the badinage of the prince and the page for his red nose and blotched countenance. In the subsequent quarrel between Pistol and the hostess, he assists in thrusting the ancient down stairs. He then accompanies Falstaff into Gloucestershire, and precedes him to Justice Shallow's. He there plays the soldier with some amount of pretence. He is then a corporal, for one of the recruits addresses him, "Good Master Corporate Bardolph, stand my friend; and here is four Harry ten shillings in French crowns for you." ⁽²⁾ He is also present with Falstaff at the battle of Bramham Moor, and then returns with him to Justice Shallow's, where he is present at the announcement of the king's death, whence they all hurry in hot haste to London. He of course shares in his master's disgrace.

Corporal Nym is only introduced into the Merry Wives and Henry V. In the two parts of Henry IV he does not appear at all, but his identity is unmistakable, his special

(1) Merry Wives, i. 3. (2) Henry IV, Part 2, iii. 2.

phrase of the "humour of it" being brought out on all occasions. In the comedy he, like Pistol, refuses to carry the letter to Mrs. Page. He says, "I will run no base humour; here, take the humour letter; I will keep the behaviour of reputation." When he is discharged, he says, "I have operations, which be humours of revenge." (1) He subsequently betrays Falstaff's designs to Page in his characteristic phraseology. "This is true; I like not the humour of lying. He hath wronged me in some humours; I should have borne the humoured letter to her; but I have a sword, and it shall bite upon my necessity. My name is Corporal Nym; I speak and I avouch. 'Tis true—my name is Nym, and Falstaff loves your wife." Page remarks, "The humour of it quoth 'a; here's a fellow frights humour out of his wits. I never heard such a drawling, affecting rogue." (2)

He does not appear again in the play, but there is a reference to him and his coney-catching propensities. Simple, Master Slender's servant, is sent to find the wise woman of Brentford, to ascertain "whether one Nym that beguiled him of a chain had the chain or no." (3)

In the opening scene of Act ii. of Henry V, Nym and Pistol are represented as differing about money transactions, embittered by the fact that Pistol had married Mrs. Quickly after some promise on her part to the corporal. Bardolph says, "It is certain, Corporal, that he is married to Nell Quickly, and certainly she did you wrong, for you were troth-plight to her."

Nym demands from Pistol—"You'll pay me the eight shillings I won of you at betting?" Quoth Pistol, "Base is the slave that pays." Nym says, "That now I will have; that's the humour of it." (4) However, Bardolph manages to effect a reconciliation, and after condoling with Mrs.

(1) *Merry Wives*, i. 4. (2) *Merry Wives*, ii. 1. (3) *Merry Wives*, iv. 5.

(4) *Henry V*, ii. 1.

Quickly on the death of Falstaff, the three worthies set out for the war in France, accompanied by the boy who had been Falstaff's page.

Pistol is commissioned as Ancient or Ensign, Bardolph as Lieutenant, and Nym is a Corporal. At the siege of Harfleur, they are represented as taking part in the assault. Bardolph cries, "On, on, on to the breach, to the breach!" Nym replies, "Pray thee, Corporal, stay, the knocks are too hot, and for mine own part I have not a case of lives; the humour of it is too hot, that is the very plain song of it." Pistol adds—

"The plain song is most just, for humours do abound;
Knocks go and come; God's vassals droop and die."

Fluellen enters and drives them forward. Pistol deprecates this advance:—

"Abate thy rage, great duke,
Good bawcock, bate thy rage! use lenity, sweet chuck. ⁽¹⁾

The serving boy expresses his opinion very freely. "As young as I am, I have observed these three swashers; three such anticks do not amount to a man. They will steal anything and call it purchase. Bardolph stole a lute case; bore it twelve leagues, and sold it for three halfpence. Nym and Bardolph are sworn brothers in filching, and in Calais they stole a fire shovel." ⁽²⁾

Their career, however, was cut short. Ancient Pistol, who, with all his fustian, does not appear to have been quite such a debased thief as his companions, tries to intercede on behalf of Bardolph:—

"Fortune is Bardolph's foe, and frowns on him,
For he hath stolen a pax, and hanged must be;
A damned death!
Let gallows gape for dog, let man go free,

⁽¹⁾ Henry V, iii. 2. ⁽²⁾ Henry V, iii. 1.

And let not hemp his windpipe suffocate ;
 But Exeter hath given the doom of death
 For pax of little price.
 Speak, Captain, for his life, and I will thee requite." (1)

Fluellen refuses to interfere, and therefore, as we hear no more of these worthies, it may be presumed the law took its course, particularly as Pistol, in his farewell reflections, makes no allusion to his quondam companions in arms.

Let us now take a glance at Justice Shallow and the little group which surrounds him, Cousin Slender, Cousin Silence, and Davy, the butler. There is a wonderfully life-like character about them of rusticity, conceit, and free and easy living. They are no doubt reproductions of actual individuals who had come within the purview of the dramatist. It is usually supposed that Justice Shallow, though the scene is laid in Gloucestershire, represents the Sir Thomas Lucy, of Charlecote, Warwickshire, justice of the quorum, into whose awful presence the youthful poet was brought, in durance vile, after his deer-stealing escapade. Cousin Slender says of Justice Shallow, "All his ancestors that come after him may give the dozen white *luces* in their coat," the luce or pike figuring in the armorial bearings of the Lucy family. Reference to the same event is made in the abrupt accusation against Falstaff, made by Shallow at their first meeting:—"Knight, you have beaten my men, killed my deer, and broke open my lodge." Be this as it may, the fussy self-importance of the old squire, the stolid simplicity of Cousin Slender, the chirruping prattle of Cousin Silence, present an inimitable picture of the rural manners of the time. One would have given something to be present at the symposium in the garden of Shallow's house, where the Justice entertains Falstaff, Silence, Bardolph, and the page, honest Davy attending on them. The potations had

(1) Henry V, iii. 8.

evidently been rather powerful. Shallow confesses—"By the mass, I have drunk too much sack at supper." ⁽¹⁾ Silence becomes talkative, and breaks into a song:—

"Be merry, be merry, my wife has all;
For women are shrews, both short and tall,
'Tis merry in hall when beards wag all,
And welcome merry Shrove-tide."

Falstaff expresses his surprise; he says, "I did not think Master Silence had been a man of this mettle." Silence replies with another song, and the jollity increases until it is interrupted by Pistol bursting in, with the tidings of the decease of King Henry IV.

Honest Davy, the butler, should not be forgotten; he seems to have been his master's indispensable factotum.

"Davy, Davy, Davy,—let me see, Davy; let me see, yea marry, William cook, let him come hither.—Some pigeons, Davy; a couple of short-legged hens, a joint of mutton, and any pretty little tiny kickshaws, tell William cook." ()

The Justice Shallow of the comedy and the histories is the same man, "Robert Shallow, Esquire, in the County of Gloster, justice of peace and coram." The grievance against Falstaff must have been of such old standing, that there was time for the animosity to cool, for when the knight goes down to Gloucestershire, to recruit for soldiers, he is received with a hearty welcome, and reminded of their mad pranks in London, more than fifty years before.

On the strength of their ancient friendship, Sir John manages to wheedle the Justice out of a loan of a thousand pounds, to be repaid when Prince Hal comes to the throne. We all know the melancholy sequel.

There is only one of the minor characters left, of whom I have not spoken, in the connection of the comedy with the histories. This is Robin, the page.

(¹) Henry IV, Part 2, v. 4. (²) Henry IV, Part 2, v. 2.

He is first introduced as a small boy in the *Merry Wives*, on the refusal of Pistol and Nym, as the go-between of Falstaff and the ladies. When he delivers his message, that Falstaff is at the back door, Mrs. Page says, "You little Jack-a-Lent, have you been true to us?" ⁽¹⁾

In the first part of *Henry IV*, the page is not introduced, but in the second part he is rather conspicuous, and more advanced in his bearing, having, it is supposed, grown in the interval. In Act i, scene 2, he follows the knight, carrying his sword and buckler. In Act ii, scene 2, he is introduced by Prince Henry as "The boy that I gave Falstaff; he had him from me christian, and see, if the fat villain have not transformed him into an ape." He is sufficiently advanced to hold his own, and is rewarded by the prince for his sharp retorts in chaffing Bardolph. He is with Falstaff on his second visit to Justice Shallow, after the battle of Bramham Moor, and returns with his master to London. In *Henry V* he is present at the death of Falstaff. ⁽²⁾

He is next found in attendance on the three confederates, Pistol, Nym, and Bardolph, during the war in France. His opinion of the character of his employers we have already seen. He further says, "I am boy to them all three; but all they three, though they would serve me, could not be man to me. . . . I must leave them, and seek some better service: their villainy goes against my weak stomach, and therefore I must cast it up." ⁽³⁾ It is to be supposed he did so, for he does not appear again.

Before concluding, I wish to say a few words on the chronology of the plays in which Falstaff is introduced. Chronology is not treated by Shakespeare with anything like pedantic adherence. The dates of events are made quite subservient to dramatic effect, and no one wishes it to be otherwise; at the same time it is interesting to ascertain what

(¹) *Merry Wives*, iii. 3. (²) *Henry V*, ii. 3. (³) *Henry V*, iii. 2.

relation the ideal world, called up by the dramatist, bears to the actual contemporary events as recorded in history. The three historical plays commence with the accession of King Henry IV, in September, 1399, and terminate with the battle of Agincourt, October 25th, 1415, embracing thus a period of sixteen years.

The intimacy of Prince Henry with Falstaff had commenced before the accession of his father, for in the very first scene the king exclaims—

———"Thou mak'st me sad
In envy that my lord Northumberland
Should be the father of so blest a son :
Whilst I, by looking on the praise of him,
See riot and dishonour stain the brow
Of my young Harry."——(1)

In the next scene the prince and Falstaff are represented as boon companions.

The battle of Shrewsbury, which is brought within the scope of the play of Henry IV, Pt. 1, and at which Falstaff was present, was fought on the 22nd July, 1403.

The battle of Bramham Moor, which broke the power of Archbishop Scroop and the northern lords, and at which the prince and Falstaff are represented, in the second part of Henry IV, as being present, occurred on the 19th February, 1408, leaving an interval of five years between the two plays. After the battle, and the capture of Sir John Coleville by Falstaff, Bardolph announces—"The army is discharged, all, and gone." Falstaff replies, "Let them go. I'll through Glostershire; and there will I visit Master Robert Shallow, Esquire; I have him already tempering between my finger and my thumb, and shortly will I seal with him." (2) Thither he accordingly repairs, and there, as we have seen, Pistol arrives post-haste with the news of the king's death. It

(1) Henry IV, Pt. 1, i. 1. (2) Henry IV, Pt. 2, iv. 4.

would appear, then, from the play, that Henry IV died soon after the battle in Yorkshire. In point of fact, there was an interval of five years between the two events, the accession of Henry V having occurred on the 21st March, 1413.

According to Shakespeare, then, the intimacy of the prince and Falstaff must have continued unbroken during a period of more than fifteen years. This is quite consistent with the representations of the knight's condition at successive periods, comparing the comedy with the histories.

We do not go to Shakespeare for the history of England, any more than we should go to Homer for a history of Greece. It is enough that each of them have lit up the story of his country's worthies with a glory which will never fade.

Connected in some measure with the chronology, is the local colour and surroundings of the characters in the plays. In the dramas now under consideration this is undoubtedly of the Elizabethan age. The transactions at the beginning of the fifteenth century, and the stately blank verse of the royal and noble personages, may suit any age; but in the familiar conversations, jokes, repartees and allusions, the manners, customs, dress and language of the glorious days of good Queen Bess are unmistakably represented. The Glostershire squire has no flavour of the Wars of the Roses about him, although he talks so familiarly of John of Gaunt. Sir Hugh Evans is certainly no Catholic priest. Page and Ford are tradesmen of the sixteenth or even the seventeenth century. Pistol is a specimen of the swaggering ruffians who derived their manners and language from Leicester's expedition to the Low Countries. The description of the dresses, the trussing of points of the men, and the thrummed hat and muffler of the women, are of the Elizabethan period. Shakespeare depicted human nature as applicable to all ages and places, but he embodied it in forms the most intelligible to those for whom he wrote.

The object of this paper has been to endeavour to show the consistent connection of the *Merry Wives of Windsor* with the historic plays ; that our great dramatist did not work at random, and in the comedy attach a new piece of cloth to an old garment ; that he had, from the first, in his mind's eye, the conception of the whole of the characters in their several relations, so that, in working out the result, there is a harmony and completeness pervading the whole. The mistake made by the critics has been in insisting that the comedy must have been written after the histories, and that therefore its place, in point of time, must be subsequent. To me this conclusion appears entirely contrary to all the facts of the case, and the proofs of this I have set forth to the best of my power. In any event, the more we contemplate these marvellous creations, the more we are struck with the subtle power of the great artist. The materials with which he had to work were of the most commonplace order ; a gross, sensual, loose-living old man ; a wild madcap prince ; a few followers little if any better than common thieves ; a pair of tradesmen, with their wives, in a country town ; two women of indifferent character ; a county justice and his friends ; and in the comedy, the parson, doctor, and host. Out of these unpromising materials, Shakespeare has woven a tissue of cloth of gold, which will compare with Homer's Shield of Achilles for the variety and interest of the scenes depicted, but of a more homely and genial character. So long as human nature remains the same, so long as the English language is spoken, so long will the wit, the humour, the abandon, the fun of Falstaff and his companions, continue to delight successive generations for ages to come.

THE PHILOSOPHY OF THE PROBABLE.

By RICHARD STEEL.

It is now nearly two hundred and fifty years since Milton penned the lines,

“ How charming is divine philosophy !
 Not harsh or crabbed, as dull fools suppose,
 But musical as is Apollo's lute,
 And a perpetual feast of nectar'd sweets,
 Where no crude surfeit reigns.”

And the sentiments thus put into the mouth of the younger brother in “ Comus ” are hardly those ordinarily current in the second half of the nineteenth century. That which is termed, in the more restricted sense of the term, Philosophy, is seldom acceptable to the practical genius of our generation. And the reason of this is partly, no doubt, to be found in the circumstance that in dealing with it physical experiments are less applicable than in the more popular branches of human research. But it is not only because we cannot distil its data in a retort, melt them in a crucible, or place them upon the slide of a microscope, that Philosophy has become thus discredited, but, in a much greater measure, because the conclusions of a dominant form of Philosophy have been found to be in direct opposition to the practical judgments of the human race. Societies like this, however, which amongst its titles claims that of Philosophical, still preserve an interest in the theories of knowledge and existence which lie at the root of all questions which investigate the intellectual constitution of man. In this ark of refuge are to be found the devotees of philosophic thought, and it is to their

sympathies and their criticism that I appeal in the treatment of the subject before me to-night.

In dealing with matters of this nature, the first necessity is to define the terms which are of most essential import. It would be a crime to leave their meaning doubtful. By *philosophy*, then, I must be understood to mean a theory of knowledge and of the nature and extent of the knowing capacity of human beings. By *the probable*, I mean such things, facts, phenomena, or, in one word, cognitions, as are not absolutely certain.

Before proceeding further we must, then, arrive at a clear and intelligible notion of what is implied by being absolutely *certain*, for language of this sort, though constantly used, is as constantly used in a sense which, though colloquially convenient, is scientifically incorrect. A man may say he is *certain* he met a friend on a given occasion. Watching an adept shuffling cards, he may feel *certain* that he can pick out a given card, off which he is *certain* that he has never taken his eye. But it is nevertheless quite possible that in the first illustration the narrator may either have mistaken some one else for his friend, or that his memory is in fault; in the second he may be made the victim of a sharper. Again, being aware, as we are, that the death-rate in the United Kingdom is between 21 and 22 persons per thousand annually, we may say, that out of the last-named number, taken at random, it is *certain* that some will die within twelve months. But that even this result has only an extremely high probability in its favour may readily be seen by contrasting with it a counter statement. It is clear that if we say that out of a thousand persons some will die within the next three years, every one would admit that this last was the more likely proposition of the two. But that can be no absolute *certainly* which is less likely than any other statement whatever, for this would be to destroy the

meaning of the term altogether, and therefore the first of these two propositions is not entitled to the claim of absolute *certainty*.

It must thus be clear that we have nothing to do, either positively or by way of negation, with what, by a singular misnomer and with the utmost inaccuracy, are termed *moral* certainties. The term may be relegated to the race-course, in connection with which it is continually found convenient to apply it to things which are not moral, and at the same time very much the reverse of certain.

It is worth while, in order to obtain a perfectly good foundation upon the important preliminary point I am dealing with, to illustrate the mental genesis of the idea of certainty, which we find subjectively attached to what should correctly be termed high degrees of probability only. Suppose an open wheel—say a fly-wheel—is made to revolve slowly before us, we can readily see the different spokes, and even count their number. If the rapidity of the revolution be increased, we can just see that there are different spokes, but cannot count them. But if the number of those revolutions be increased beyond a certain rate, we can no longer see the spokes at all, and the appearance is similar to that of a disc; the revolving wheel and the revolving disc convey exactly the same impression of continuity of surface to the eye. An analogous result may be observed if we take a round piece of wood or cardboard, and paint upon it in different sections different colours, and then cause it to rotate. Whilst still, or moving slowly, the different colours are obvious; with a certain rapidity of motion they blend into one resultant colour, and I need hardly add, that if the colours are arranged in due proportions, as in what are termed Newton's discs, that resultant colour is white.

These effects are due to the physical limitation of our seeing faculty. If impressions upon the retina follow each

other at more than a certain rapidity of rate, they are no longer discriminated, but blur into and mix with each other.

Precisely a similar process occurs in relation to our mental judgments, as far as high degrees of probability are concerned. We are quite prepared, in our changeable climate, to admit that it is uncertain whether it will rain, say, during the next six hours. Most people would probably say that it was nearly certain to rain during the next fortnight; but we would one and all be ready to affirm that it was quite certain, using the term in the colloquial but not scientifically accurate sense, that we should have some rain in Liverpool before, say, the middle of next month. In these related statements we see the degree of probability rising higher and higher, till we term it a certainty, not because it really is such, but because the degree of probability is so high that we do not discriminate between it and what is nevertheless a distinct thing, absolute certainty; just as we were not able to discriminate the different spokes of the wheel or the different colours of the disc. In the same way that high numbers, say billions, trillions, quadrillions, and so forth, are quite incapable of being mentally realised, so a high degree of probability, which perchance would be mathematically measured in such terms, is regarded as a certainty from an impotence of our faculties corresponding to that which prevents our being able to appreciate very high numbers, except as appearing relatively to us a species of infinity. But a certainty in its true philosophical and mathematical sense means something for which there is no possibility of an alternative, not a something for which the chances are a decillion to one, but for which the probability is as infinity to nothing.

It is so essential to the comprehension of what is to follow, to be quite clear upon the point on which I have been dwelling, that I have ventured to be tedious in regard to it; but it is always better to be tedious than obscure,

What knowledge, then, does the human race, and do we human individuals, possess of this high order? If there be any such, with it my paper has nothing to do. The knowledge of our own existence must *practically* be so regarded, for it is clear that we cannot conceive of anything more certain than our own existence, and it is therefore *relatively to the human mind* an absolute certainty. It follows that the *Cogito ergo sum* of Descartes, relieved of its ambiguities, must be adopted either explicitly or implicitly by all sound philosophical systems. I am aware that there are those who have disdained the foundation of Descartes, but it must be held, in spite of every contention to the contrary, that our own existence in the act of thinking is either an axiom or a necessary postulate of all systems of thought. And the difference between an axiom and necessary postulate is almost, if not entirely, purely verbal. The exact relation the maxim bears to the views here propounded will appear more fully at a further stage of this paper.

But proceeding from this central ground, what further do we human beings know, and what is the nature of our knowledge? Some philosophers contend that we possess innate ideas, a birthday possession of each member of the human race. Now, the first essential in dealing with innate ideas is similar to the first essential act, the proposition of which is generally attributed to Mrs. Glasse in her directions for the preparation of hare-soup. To first catch your innate ideas alone and by themselves is the initial difficulty for the positive side of this historic controversy. But I am relieved by the definitions pertaining to my subject from all necessity of expressing any opinion upon it, for it is clear that if there are innate ideas, they are, as such, part and parcel, necessary conditions and constituent parts of existence, as such, of the nature of certainty, and as such excluded from this enquiry.

But the great bulk of our knowledge remains to be dealt

with. It is derived or compounded from those activities which we term respectively the *senses*, the *memory*, and the *reasoning* power. And the first proposition which I would now lay down is, that all knowledge derived from *sense* impressions is probable knowledge only, and does not possess the nature of absolute certainty. It does not, therefore, cease to be knowledge, and that too a knowledge of things in themselves, for here I am at issue with both the philosophic Agnostic and the Sceptic, as I shall presently show.

From the definition already given of philosophic certainty it is clearly sufficient, in order to establish the proposition just stated, to show that there is an element of possible error in all the senses, however small that chance of error in any individual instance may be. But it is notorious that each and all of the senses are liable to error, amongst which are those errors classified by the learned as hallucinations and illusions. In the case of persons who are accounted insane, chiefly of course because their ideas are different from those of the majority of mankind, these inaccuracies of sense are of constant and daily occurrence. But there are multitudinous cases of errors of the senses amongst those who are admitted to be sane by the unanimous verdict of their fellows, and some few of these cases I will now cite, for the elucidation of my argument.

It is probable that of all the senses that of sight is the one which is most relied upon, and through which the greatest number of sense impressions is received. I begin, therefore, with the organ of sight. History abounds with its errors, and our own experience is not free from them.

Plutarch tells us that as Brutus sat in his tent one evening, a horrible and monstrous apparition suddenly stood beside him, and in a loud voice said, "I am thy evil genius, Brutus. Thou wilt see me at Phillippi." He told Cassius of the incident shortly afterwards, but Cassius, who was an

Epicurean, explained correctly enough that it was a mere illusion of the fancy. But we do not need to go so far back as Brutus, though his was the first case that occurred to me when writing this paper. Luther, we learn from D'Aubigny, whilst busily engaged in the Castle of the Wartburg, translating the New Testament, was annoyed by the appearance of the Enemy of mankind, and with characteristic vehemence he threw an ink bottle at his head, marking the wall with the blow ; and this, we learn from other sources, was only one of many similar interviews, for Luther appears, and of course upon immeasurably better authority, to have been almost as much troubled by unsympathetic visits from the Prince of Darkness as was that somewhat mythical saint, St. Dunstan. A well-known case is that of Nicolai, a bookseller of Berlin, who lived towards the close of the last century. He was visited day after day, for a considerable period, by a great number of apparitions, and, in fact, might have been said to hold a species of levée for the ghostly world, as they walked in and out of his rooms with regularity and system ; and, lest non-professional members of the Society should think that I am exaggerating, I may say that this is a perfectly well-authenticated case, and is cited as such by medical authorities of high standing. Nicolai was quite aware that these appearances were hallucinations, and, being a man of a Literary and Philosophical turn of mind, took much interest in the behaviour of his visitants, and described them in considerable detail. Dr. Abercrombie, in his well-known work on the intellectual powers, tells us of a gentleman who, when he met a friend in the street, was never sure whether he was real or only a spectre, until he had touched him, being quite accustomed to meet spectres walking about in the most realistic fashion. Napoleon, we are told, on one occasion tried to point out to General Rapp, who was engaged with him in a *tête-à-tête*, a brilliant star, which he affirmed

was always present with him, but which no one could ever see but himself. When Sir Joshua Reynolds walked the streets, after being engaged in painting, the lamp-posts seemed to him to be trees, and the men and women moving shrubs. The mirage of the desert will occur to every one as a case in point—an appearance, as we are told, which brings up before the eye of the traveller over the thirsty wilderness, waving palm trees, a distant plain covered with rich verdure, and a peaceful stretch of water. Rather a singular case, of what must have been an optical delusion of some sort, came under the attention of the scientific world not long ago. In view of the transit of Venus, which occurred in 1874, a great deal was made beforehand, by Mr. Proctor and others, of a certain extremely troublesome black drop which had appeared at the moment of internal contact, at the previous transits of 1761 and 1769, and which had been the hypothetical cause of great errors of calculation. When the transit of 1874 came off, however, this obnoxious black drop did not make its appearance, in spite of the elaborate precautions which had doubtless been taken to baffle its malign influence. Sir Walter Scott, we read, saw Byron sitting in his hall shortly after Byron's death, and though quite aware that he was the subject of a hallucination, remarked upon the minute accuracy of the appearance, even down to details of dress. The astronomer accounts it as one of the greatest advances in his scientific methods that a law of error has been constructed which, *inter alia*, corrects the admitted errors of personal observation, and the invention of this method, that of least squares, is one of the laurels which hang over the tomb of the celebrated Laplace. And there is a whole class of visual hallucinations, whose name is legion, and of which I will just cite one. The parish church of Knock, in Ireland, was the scene of the apparition of certain saints to a sufficient number of observers. And, in

relation to this last case, and all those *sui generis* which will occur to the minds of my audience, it is well to remark, in passing, that I am saying nothing which can be offensive to any religionist in classing them as illusions, for we have it upon the authority of a learned cardinal of the Church of Rome, that that Church itself accords but little authority to all special visions. She tolerates some, but in the mass she rejects them, and even when the visions are approved of by the Holy See, each person is still at liberty to form what opinion he pleases as to their causes, even such as do away with their miraculous character.

Next to sight in importance, probably, comes our sense of hearing. This sense, again, is the subject of many illusions, and I think that people generally are pretty well aware that their hearing is not to be relied upon as an immaculate witness. "Did I hear aright?" "If my ears did not deceive me," are something more than phrases of astonishment, and indicate that people are quite open to conviction, upon what appear to have been reports of this sense. But to take a few specific cases. Dr. Forbes Winslow tells us that Descartes was followed by an invisible person calling upon him to pursue the search for truth. M. Briere de Boismont, to whom I am indebted for several other of the cases cited, tells us that he knew many persons, and amongst others a medical man, who, when it was night, distinctly heard voices calling to them. Some would stop to reply, or would go to the door, believing they heard the bell ring. But perhaps the most notable of all cases is that of the celebrated Jean, or Joan, d'Arc. The heroine, when thirteen years old, heard, for the first time, *la voix* stating that France would be saved by her, and from that time these voices—these hallucinations—were repeated at intervals, until they became the motive power which shook off the English yoke, rolled back the tide of foreign invasion, and raised the lilies of France out of the

depth of prostration to which that great country had been reduced by the weakness of her rulers, and by the valour of our countrymen. And, just to give one other case, we have that of the well-known Swedenborg. In a letter to Oelinger, of Wurtemberg, dated November 11th, 1766, the following passage occurs:—"If I have spoken with the angels? To this I answer, I conversed with St. Paul during a whole year, particularly with regard to the text, Romans iii. 28. I have conversed with St. John three times, once with Moses, and a hundred times with Luther; with angels, finally, have I these many years conversed, and that daily." It is interesting, in connection with this case, to remark that Swedenborg may have been, to a certain extent, aware of the hallucination, though he never admitted it, for he says again, "The speech of an angel or a spirit finds entrance into a man's thoughts, and reaches his organs of hearing from within." Again, the case of Brutus occurs to us, and, it may be added, too, that Nicolai's ghosts commenced to speak to him after about a month's acquaintance, and that, too, in a pleasant and sympathetic manner. But I need not multiply instances of the inaccuracy of hearing. In the great mistakes which are continually made by the partially deaf, we have a convenient illustration of the illusions of this sense. We have but to remember that in respect of less distinct sounds, we all assimilate to this condition of deafness, which is itself entirely a relative term. We have but to remember how we ourselves like sometimes to hear a thing over again, in our ordinary experience, to make sure of it, as the saying is, and we obtain quite sufficient corroboration of the specific instances I have already cited, in order to show the liability of our auditory impressions to error.

The other senses I will dismiss more briefly, for no one has the same confidence in his taste, his smell, and his touch as in seeing and hearing. In accuracy of smell some of the

lower animals far surpass mankind. Wordsworth, the poet, had no sense of smell; only on one occasion, when bending over a bed of stocks in full bloom, did the exquisite sensation steal over him, but it left him never to return. A woman, spoken of by De Boismont, at times became possessed of the illusion, though conscious that it was such, that all women she met smelt of musk, and all men of tobacco. It is upon the inaccuracy of the sense of taste that the highly-developed modern art of adulterating food is based. And we know that as far as touch is concerned, the illusion is complete after a patient has had a limb taken off, and under other circumstances which might be cited.

Enough has been said, however, to establish the proposition I laid down, that all the *senses* are liable to error, and that knowledge of which sense observations and impressions form part, can therefore only be of a probable character. The drop of possible error remains, and though you may dilute it, and redilute it, yet, just as the homœopathist tells us that the active principle of his drug remains, even when the quantity is extremely small, so does the latent possible error of the senses prevent absolute *certainty* ever being attained through their medium.

And what has been found true of the senses will also be found true of the *memory*—that marvellous faculty by which the impressions of sense are compared with each other, and whose existence renders reason possible. That memory is fallible no one would attempt to controvert; and that it is fallible, not only in possible forgetfulness, but in possible misrepresentation of the thing remembered, can readily be shown. Rochefoucauld laid it down as a maxim that people admit their faults in the plural, but deny them in the singular, and the maxim is peculiarly apposite in the case of memory. There is no one so hardy as to deny, as a general proposition, that his memory is sometimes inaccurate, though

in relation to any individual instance of its accuracy being challenged, most people will pertinaciously refuse to believe that they can possibly be in the wrong. The fallacies of memory are in themselves a most interesting study, and there can, I think, be little doubt that, as suggested by an ingenious writer in the "Cornhill Magazine," for May, 1880, even the land of dreams contributes its share, and that stray threads from visions of the night are often woven into the tissue of what we believe to be our waking recollection. But I cannot follow up side issues of this nature, and in addition to the appeal which I make to the individual consciousness of everyone as to the inaccuracies which they must be aware have crept into some of their own recollections, I need only point to our courts of law, to cases, say like the Tichborne case, in which conflicts of evidence occur, and those sometimes between truthful and candid witnesses, which can only be attributed to divergent errors of recollection.

The only other mental activity which remains to be considered is that of the *reasoning* power. Here, again, an interesting inquiry opens up, which it is not necessary for my argument to do more than glance at. That the reasoning faculty is liable to considerable error, is evident from analytical investigation of the nature of logic, with its intrinsic error of requiring the assumption as universal truths, of truths which can only be known to us as a multiplication of particular cognitions. But it is sufficient for my purpose to prove the frequent fallacies of reason by experience. We continually have men arriving at different results from the same data. Thus men of different political creeds come to exactly opposite conclusions upon the same political case. And again, in religious matters, the different sects into which religions are divided prove, each to their own satisfaction, their own view of the points in dispute between them by reference to the same sacred literature. The liability of reason

to error follows as a necessary inference from these considerations.

We have therefore finally arrived at this conclusion, that *all* the channels through which our conceptions reach us, and in which they are formed, are liable to error; and it only remains to complete this part of my subject to point out that, in the ideas which are derived from *memory* and *reason*, this error is of a cumulative character. For in the last resort the things we remember were originally objects of sense, or in any case derived functions of objects of sense. And in our recollection, therefore, there is the possible original error of observation, as well as the possible error of memory. Again, with the results of reasoning we have a triplex possibility of error—the possible error of observation and its derived functions, the possible error of memory, by which the observations are compared with each other, and the possible error of the logical process by which our inferences are drawn.

What, then, is the deduction to be drawn from these data? Simply, I assert, this, that all knowledge which human beings can possess, exclusive of those small possible reservations made with regard to our own existence and its concomitant but hypothetical innate ideas, is *probable* knowledge only. It is nevertheless a real knowledge, and a knowledge of things external to ourselves, as well as of ourselves. Although our reason is sometimes at fault, yet in the majority of cases its processes have a high degree of validity. Although our memory is not infallible, yet the number of its misrepresentations is much less than the number of its correct representations. Although our senses, each and all, sometimes deceive us, yet in the vast majority of instances their teaching, though not conveying a full idea of the nature of things in themselves, is nevertheless *probably* correct, and in accordance with the nature of things, as far as it goes. All human knowledge can be expressed in terms of Probability,

and can correctly only be so expressed. In that knowledge there are varying degrees, some so high as to convey to our imperfect faculty of apprehension the sense of absolute certainty, though absolute certainty can only be realised by an Absolute Being, and is as much an unrealisable symbol to us as is a perfect circle or a mathematical line. The highest realisable probability attaches to the truth of facts which are susceptible of constant verification through the medium of the senses, the difference in this case of the probability reached, and absolute certainty, being the difference between a convergent series and its mathematical limit, and the relation that which subsists between a curve and a straight line which is its asymptote.

Of all verifiable facts, the ontological existence of an external world is therefore the fact which, next to our own existence and its connotations, reaches the highest degree of vast probability. Of all the specific existences forming part of that to each of us external world, the existence of minds similar in constitution to our own in the fellow-beings of our race, possesses the next great weight of probable evidence in its favour. For the co-ordination of mind, as illustrated in that wonderful instrument of language by which the most complex modification of our own minds elicit corresponding modifications in those of others, is far more elaborate than the co-ordination of all other known things. But the co-ordination of things external is a constant factor in all our impressions, and we derive at once an immense probability that our minds are, like the rest of what we observe, co-ordinated to that which we do observe. And hence again flows a preponderating probability far exceeding that of any alternative hypothesis, that all external objects have in themselves and in a true ontological sense, qualities which correspond to the idea which we entertain of them. But the complete expansion of probabilism, thus applied, is clearly not within

the limits of a paper such as this. I will merely say of it now, that it is a theory which, aside of what I believe to be its native impregnability, is eminently the theory which teaches us to weigh all things, to respect the opinions of others even when they differ from us, and to establish as a necessary corollary the most perfect tolerance in all matters of judgment and of thought.

But it is necessary for me to take up the dialectic into which the positions already advanced have led me with what may be regarded as the typical philosophical schools, the Scottish school of Natural Realism, the Agnostic, and the Sceptical.

With the Scottish school I have long felt the greatest sympathy. Its views are so much more in consonance with the general ideas of mankind than those of any of the other systems, that it is only by a pure process of conviction that I have been forced to surrender their validity. But it appears to me that however much in the hands of Reid they might appear plausible, that plausibility resulted from want of precision. In the hands of Sir William Hamilton, who was precision itself, the radical weakness of the system became obvious. Sir William Hamilton was the ablest metaphysician of his day, and his dissertations are a marvel of close and subtle reasoning. But he is compelled by the necessity of things to rest the Philosophy of Common Sense upon the accuracy of the deliverances of consciousness. He says, in his formal statement of the doctrine and speaking of consciousness :—"The immediate or mediate repugnance of any two of its data being established, the presumption in favour of the general veracity of consciousness is abolished, or rather reversed. For while, on the one hand, all that is not contradictory is not therefore true, on the other hand a positive proof of falsehood in one instance establishes a presumption of probable falsehood in all; for the maxim, '*falsus*

a position to appeal to this thinking faculty, and point to it as the final answer to any denial of the estimation of probabilities; for thought is itself such an estimation, and such estimation is the primary form of thought.

Oddly enough this is a fact which is susceptible of a ready illustration. We are all aware of the circumstance that in the older English, and in the language of our American cousins, the word "guess" is employed, where with us the word "think" would be used. Now, we know very well that with us the word "guess" implies a considerable degree of uncertainty in the thing guessed, and means simply that we estimate the probabilities to lie in a particular direction. But though used in different shades of meaning, as indicating with us a broader chance of error than with the American, the word "guess" has not changed its essential signification. It has only developed. And the word "think," which we have substituted for it, will be found upon close examination of the sense in which we use it, to reserve exactly the same contingent possibility of error, though not in so large a proportion. If one says, "I think such and such was the case," we at once understand him to imply that he is not quite sure. All thought is, in fact, really a tentative process of estimation, and in this circumstance lies, I believe, the central palladium of philosophic probabilism.

Perhaps, again, as Mr. Herbert Spencer, of all others, most fills the philosophical field at the present time, I may be permitted, in his special case, to push the argument, to a certain extent, into his own ground. It is, I need hardly say to his readers, the first portion of "First Principles" which is occupied by a statement of his philosophical views, using philosophy in the sense in which I have used it. And one step in the process by which he establishes the unknowableness of things in themselves is by pointing to the alternative impossibilities of thought to which you are led by any theory of the exist-

ence of matter. With Herbert Spencer, the inconceivable becomes the impossible. But if the probable method is of any value, there is a higher degree of probability for the accuracy of the continuous verdict of sense than for the accuracy of the continuous deduction of reason. And the existence of matter in extension being a constant factor of sense, the inconceivability in reason of its so existing is the lighter weight in the scale, and a solid probability of its so existing in extension remains as a residuum. A nearly equivalent idea is aptly stated by Lord Bacon, when he says, "All merely logical expressions are valueless, the subtlety of nature far surpassing that of argument." Before leaving Herbert Spencer, let me say, in conclusion, that with all deference to an eminent and able writer, I cannot understand why a philosopher, the main portion of whose fundamental work professedly deals with the three incomprehensibles, should dismiss the inconceivable with such unrelenting disallowance.

And now I will approach the sceptical position. There may be those who see no distinction between agnosticism, in the sense in which I have used the term, and scepticism; but there is a very essential difference indeed. The philosophical Agnostic shuts up the whole question dogmatically. He conjugates over you triumphantly the present tense, indicative mood, of the verb *agnoscere*—I know nothing, thou knowest nothing; he, she, or it knows nothing of things in themselves. But the Sceptic, on the other hand, urbanely listens to all you are pleased to tell him you think you know, and then pleasantly proceeds to whittle away the basis of all knowledge whatever; he never dogmatically asserts the impossibility of any portion of it. Thus Hume tells us, "A true Sceptic will be diffident of his philosophic doubts, as well as of his philosophical convictions;" and in this sentence finely illustrates the distinction I have pointed out.

Although Hume has had his followers, I am not aware

that the whole sceptical view has been more clearly expressed than in his well-known treatise. He does not deny; he doubts destructively; and the following quotation from his treatise on Human Nature may be taken as the key-stone of his system, and as the essential method by which he pares away the validity of all knowledge.

“Having thus found (he says), in every probability beside the original uncertainty inherent in the subject, a new uncertainty derived from the weakness of that faculty which judges, and having adjusted these two together, we are obliged by our reason to add a new doubt, derived from the possibility of errors in the estimation we make of the truth and fidelity of our faculties. This is a doubt which immediately occurs to us, and of which, if we would closely pursue our reason, we cannot avoid giving a decision. But this decision, though it should be favourable to our preceding judgment, being founded upon probability, must weaken still further by a fourth doubt of the same kind, and so on *in infinitum*; till at last there remain nothing of the original probability, however great we may suppose it to have been, and however small the diminution by every new uncertainty. No finite object can subsist under a decrease repeated *in infinitum*, and even the vastest quantity which can enter into the human imagination must in this manner be reduced to nothing.”

It is very extraordinary that the intrinsic fallacy of this argument has not, as far as I am aware, been pointed out, for it is one which becomes evident if viewed with even a slight knowledge of the mathematical science of probability. It can readily be shown that probabilities must be represented by a fraction of the symbol or number taken to represent certainty. Thus, if certainty is taken as one or unity, any probability must be taken as something less than unity, according, of course, to its inherent weight. But if a fresh probability is taken account of in connection with the

original one, you find the resultant, not by subtracting one from the other, which is the process Hume suggests, but by multiplying the one by the other. This makes all the difference in the world. You can by no such process, even if it be conducted *in infinitum*, arrive at *nothing* as a result. Multiply $\frac{1}{2}$ by $\frac{1}{2}$, or any one fraction by any other fraction, as often as you like, and you will always have a fraction left, though a decreasing one. And again, it is clear that an original supposition presupposes only one absolute contradictory; and that alternative contradictory, for all purposes of fair comparison, is also dwindling by multiplication, *pari passu*, with the original supposition. At any stage of the process, therefore, the ratio between them will remain nearly the same, that is, within moderate limits, and if the multiplier be small in comparison. So that Hume's argument, fundamental so far as mine comes into collision with him, is based upon what is really an arithmetical error.

So much for the philosophic schools. I will now quit the field of controversy. The discussion has had its use, as illustrating the nature of the views now propounded, but it cannot have failed to have been fatiguing to an audience. My sole remaining task is to show that this theory of probable knowledge bridges over at once the chasm which has been supposed to separate philosophy from the ordinary conceptions and beliefs of the human race. No one, for example, knew better than Hume himself, or could have stated it more clearly and eloquently, that his doctrines ran directly counter to the practical judgment of humanity; and he came, therefore, to the conclusion, as also have many of the agnostic school, that right reason and common opinion contradict each other by a fatal necessity. But if the Probable Philosophy is adopted, this is no longer the case. For it is the very maxim of all men that, in the practical affairs of life, there is nothing certain. From our earliest intelligence to our latest day we

are engaged, as a matter of ordinary concern, in dealing with what we know, when we stop to analyse them, to be matters of probability only. The two-year old child playing on the hearthrug realises, by experience of past events, that the probable result of pulling the tail of his chosen friend, the kitten, will be disastrous. The doctor, bending over his patient and watching his symptoms, is well aware that he can draw only a probable inference, and that there is a considerable possibility of error in even his skilful judgment. The merchant has to cope with the uncertainty of markets, the farmer with the uncertainties of weather, the statesman with that most uncertain of all things, the amount and effects of the stupidity and obstinacy against which he has to contend; the traveller by land or sea knows full well that he may or may not reach his destination in safety; even the inborn taste for games of chance, the gaming faculty, one of the most universal mental facts, bears witness to this essential element in our constitution. The human mind is a machine for weighing probabilities—they form its natural aliment and food. Just as the tree-dwellers of African and South American forests swing lightly from yielding branch to branch, and are not at home upon solid earth, so is probable knowledge the quivering hand and foot hold in the vast profound of the Possible, by which alone the human being can grasp those essential truths which co-ordinate themselves to his nature, and which he may rest assured are in themselves a true knowledge of both himself and his surroundings.

But if philosophic probabilism thus harmonises with men's ordinary judgment, so also does it reach out a hand to mathematical science in some of its most valuable developments. It would be a work of time to even glance at the history of the mathematical theory of probabilities; but this I may say, that it is a department of comparatively modern growth, and that its essential

concepts are entirely at one with those which form the body and substance of the theory of knowledge here propounded.

And, to use the language with which this paper will have made my audience but too familiar, there is a vast probability in favour of the correctness of a theory which thus harmonises not only our most commonplace judgments with our most abstract, but is also in its terms and in its methods corroborated by and closely allied to a department of mathematics which is largely affiliating itself to practical human requirements.

I conclude with a sentence from Laplace, which he applies to his theory of probabilities, and which requires no alteration to connect with the views here laid down.

“ On voit par cet essai que la théorie des probabilités n'est au fond que le bon sens réduit au calcul ; elle fait apprécier avec exactitude ce que les esprits justes sentent par une sorte d'instinct sans qu'ils puissent souvent s'en rendre compte.”

ON THE TRANSLATION IN THE AUTHORISED
VERSION OF THE NEW TESTAMENT OF SOME
OF THE COMPOUNDS AND DERIVATIVES OF
κρίνω (*krino*) ; AND ESPECIALLY OF *κατα-κρίνω*
(*kata-krino*), AND *ὑπο-κρίτης* (*hypocrites*).

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THE verb *κρίνω* (*krino*) and its derivatives and compounds are of frequent occurrence in the New Testament, and whilst in most cases the translation in the authorised version appears to convey the sense so accurately as to leave nothing to be desired, there are a few in which, owing to the changes which the English language has undergone since the time of James the First, in common with all other living tongues, the words that were then used correctly to convey the desired meaning have, by the present time, so far altered their significance as to convey now either a defective or an erroneous meaning to the public mind. And it is to the public mind of average education, as well as to the intelligence of highly educated men, that a version of the New Testament is addressed, which is always publicly read in various places for divine worship. If, therefore, an alteration should be proposed which shall convey the sense correctly to an uneducated person, and shall also fulfil the requirements of an educated man, while, at the same time, it removes misconceptions that have come to be attached to the translation made nearly three hundred years since, the cause of truth will be advanced and occasions of misconception lessened. A few such changes I propose to point out this evening ; but, while doing so, I desire to place

them before you for your criticism, and, at the same time, to express the sense, which has become deeper and deeper with continued investigation, of the wonderful accuracy and value of that authorised version of the New Testament which has so long been the inheritance of all English-speaking men, both learned and unlearned alike.

PROPOSED CHANGES.

The changes which I propose chiefly to submit to your consideration to-night, are the change of "hypocrites" in some places into "interpreters, or diviners," and the change of the word "damnation" into "condemnation," or "judgment," or some similar word which may be appropriate to the context. (See table of proposed changes, p. 158.)

MEANINGS OF *Kρίνω* (*krino*) AND ITS DERIVATIVES.

The word *κρίνω* (*krino*) forms the basis of all the words we shall have to consider, and its various meanings are naturally derived from one another. It means primarily simply to "separate" or "divide," but it ends with "to pass sentence of capital punishment." Let us inquire, therefore, how two meanings, having apparently so little connection with each other, should be attached to the same word.

The result of separation by an intelligent person is probably to arrange the matters so separated, and therefore to "arrange" is a natural meaning. But in order to arrange the separated things, enquiry and care are requisite, and therefore "to enquire or search into," "to distinguish between," and in many cases to "prefer one thing to another," are all naturally derived from the original idea of simply "separating."

But from separating or dividing simple things to separating or arranging arguments or conflicting claims, is an easy transition, and accordingly "to decide a contest for a prize,"

or to "settle a dispute," is a further natural meaning of the word; and as a judge implies a contest, "to contend, dispute, or quarrel" are other natural meanings. Since, however, a judge is often called upon to give the grounds for his judgments, "to expound or to explain" while pronouncing judgment is a still further natural derivative; and as all experience shows that contests or disputes generally arise from evil doing on one side or the other, "to accuse or bring to trial" is, unhappily, another natural derivative; while the "passing of sentence" or "condemning" is the last link of the chain which commenced with simple "separation," and has thus naturally ended in a "sentence," it may be, of capital punishment.

The Greek *derivates* from *κρίνω* (*krino*) which I desire chiefly to bring before you are *κρίτης* (*krites*), a "judge," an "arbiter," and also an "expounder" or "interpreter," its adjectival form being *κριτικός* (*kritikos*), "fit for trying or expounding;" critical, with its compound *ὑπο-κρίτης* (*hypocrites*), an "interpreter," a "stage-actor," a "pretender," a "hypocrite," and also *κατα-κρίνω* (*kata-krino*), a compound which, in addition to simple "judgment," always implies unfavourable judgment—"condemnation."

Κατα-κρίνω—(*kata-krino*).

But here it is necessary to remember that "condemnation" and its judicial sentence may range from the slightest imaginable punishment to the most severe that can be inflicted. "Farthing damages" is familiar to every one as an illustration of the fact that although the defendant is "judged" to have been wrong, and is "condemned"—*κατα-κρίνεται* (*katakrinetai*)—to a penalty, it is only the very smallest amount that can be named. And, in like manner, even in criminal cases, we must all have heard such a sentence passed as that the prisoner shall be confined "until

the rising of the court," which will inevitably be in a few hours, and may possibly be in a few minutes. The accused person has been guilty, and must be "condemned," but the sentence is the smallest that the judge can possibly inflict.

The distinction between "damnation" and "condamnation," or "condemnation," as it is usually spelt, depends upon the preposition "con," "with," and is important. Damnation simply expresses the fact of a person being sentenced, without any reference to the amount of penalty; but *con*-demnation implies a sentence having regard to the circumstances, "con," "with" which the offence was associated. These attendant circumstances may have been so grave as to call for the severest sentence, or they may have been so mitigating that the sentence is reduced to a nominal amount, as in the instances just given.

If, however, we had been, like our ancestors, dependent upon a Greek and Latin dictionary, instead of a Greek and English one, for learning the meaning of Greek words, we should have found *κατα-κρίνω* (*kata-krino*) translated by "damno," and it is the translation of the Greek into "damnation," in the authorised version, through the Latin "damno," that must now occupy our attention.

"Damno," in Latin, has a very different signification from "damnation," as that word is commonly understood by ordinary English people, and even by many educated persons. It means *first* to "bring loss or occasion damage," without any reference to its amount; and only in the *second* place to "condemn or sentence any one;" also without any specification of the nature or severity of the sentence. Thus it is equally used when any one is sentenced to death, to hard labour, to a fine, to a restitution of stolen goods, or even simply to the fulfilment of an engagement. And a person who was "damnatu8," was not only one who was sentenced to any one of the above penalties, but even one who was

simply "bound to fulfil a vow." The Latin "damno" was even applied to an unfavourable criticism of a book, and we have still this sense of the word in common use among ourselves when we talk of "damning with faint praise."

GROUND'S FOR PROPOSING THE CHANGES.

In modern English, however, the word "damnation" has unquestionably a signification very different from the above; and whilst "damno" in Latin, and *κατα-κρίνω* (*kata-krino*), in Greek, imply penalties of a temporal character only, the English word "damnation" is generally understood to mean something eternal; and while both the Latin and the Greek refer to penalties inflicted on the property or the body of a person, the English word is now commonly understood not to relate to the body at all, but to affect the spiritual part of the man. It is evident, therefore, that if this word "damnation" in English is used to represent the Greek word *κατα-κρίνω* (*kata-krino*), it may seriously misrepresent it both in character and degree. As an illustration, I would refer to St. Paul's Epistle to the Romans, xiii. 2, in which, after exhorting his friends to return good for evil, he goes on to enforce the duty of obedience and submission to the civil authorities, because all who are in authority are "ordained of God." He then proceeds to urge, further, the consequences of disobedience or resistance, and says that if the Romans do well they will have praise and reward, but if they resist the authorities they will receive—What? *Κρίμα* (*krima*)—"judgment," "sentence." Now, if a "corner-man," among ourselves, resists "the authority"—the police—he will receive "six months." If a disorderly drunkard resists, he will receive "a week." If an organised or armed resistance is made, the penalty will be "penal servitude," or "sentence of death;" but from the simple "five shillings and costs" to the "capital punishment," all are alike—*κρίμα* (*krima*)—"judgment," "sentence."

When, then, we find that in the authorised version of the New Testament, this word *κρίμα* (*krima*), in Rom. xiii. 2, is translated "they that resist shall receive to themselves *damnation*," we see that a meaning is put upon Paul's language very different from that which he himself intended.

The same word, *κρίμα* (*krima*), is used by the same writer when, in addressing the Corinthians (1 Cor. xi. 29), he says that whoever, in partaking of the Lord's Supper, shall eat and drink—*αναξίως* (*anaxios*) unworthily—shall eat irreverently, or drink to excess, as some of them did, such an one would eat and drink—*κρίμα* (*krima*)—to himself "judgment," "sentence;" and the character of this "judgment," he goes on to describe (v. 30)—"For this cause many among you are weak and sickly, and some sleep;" but none of these penalties correspond in any sense with the ordinary meaning at the present time of the word "damnation," which is employed in the authorised version. The word which Paul himself further uses, in speaking of this punishment, is *παιδεύω* (*paideuo*), to "chasten" or "correct," as we do children—from *παις* (*pais*), a child. He does not employ any word that implies to kill, to destroy, or even to punish grievously, but the simple word *παιδεύω* (*paideuo*), to chastise as one would our children. Certainly, very far removed from the modern idea of damnation. In the 34th verse of the same chapter, the very same word, *κρίμα* (*krima*), is translated by "condemnation," which makes the employment of damnation, in the 29th verse, without apparent explanation.

There is another instance to which I would direct your attention. In Matt. xxiii. 33, Jesus had been upbraiding the Scribes and Pharisees for saying that if they had been in their fathers' place they would not have killed the prophets, although, as He says, they were seeking to kill Himself, and would eventually kill both Him and many of his disciples. They were, therefore, now in heart, and would soon be in

deed, accomplices with their fathers in the slaughter of the prophets; and how should they then be able to escape the κρίσις τῆς γέεννης (*kriseos tes Gehennes*), "the judgment of Gehenna." Now, what was that judgment? Every Jew was familiar with the Valley of Hinnom, into which the bodies of great criminals were often thrown, there to be eaten by worms, or to be consumed by the fires which were never quenched, but were always burning there. And if the generation that he was addressing were accomplices with their fathers in the murder of prophets, how could they expect to escape from the penalty inflicted upon other murderers—to escape from the judgment of Gehenna?

In another discourse, he was exhorting his hearers against giving way to anger, and he warned them that if they were angry without a cause, they would be in danger of the κρίσις—the judgment—the local and least powerful of the criminal courts among the Jews; for they might cause a disturbance that would bring them "before the magistrates," as we might express it. But if they used provoking language, they would be in danger of creating such a serious quarrel as might result in consequences that would bring them before a higher tribunal—"the Council"—or, as we might say, "the Quarter Sessions." If, however, their language was still more aggravating, the quarrel might end in a fight, which might result fatally; the provoker might become the killer, or might himself be killed. In the one case the "judgment" would be that he met his death deservedly, for he had himself provoked the quarrel, and his dead body would be thrown into the Valley of Hinnom, the Gehenna. In the other case, his trial would end in sentence of death—a sentence which, among ourselves until recently, was followed by the gibbet, as an additional indignity to the murderer's body, and, among the Jews, was followed by the body being thrown into Gehenna. Now, this succession of gradually

increasing penal consequences of uncontrolled anger is natural, and would appear so to those to whom it was addressed; but when it is translated, "but whosoever shall say 'Thou fool,' shall be in danger of hell-fire," we see that those words, in the modern signification, convey a meaning very different from that of the original. In the first of our examples, the warning to the Pharisees, "How can ye escape the *damnation* of hell?" also now conveys an equally incorrect impression of the words used, and the substitution, in the first case, of the words "judgment of Gehenna" for "damnation of hell," and, in the last instance, a translation "shall be in danger of the Gehenna of fire," instead of "in danger of hell-fire," would convey the meaning with greater literal accuracy, and would obviate the misconception which is derived from the modern popular use of the words we object to.

In the record of one of his warnings, against the conduct of the Scribes, given by Mark, xii. 40, and Luke, xx. 47, Jesus contrasts their behaviour, when in the synagogue and in public places, with their conduct in other respects. He says that they wear long robes and love to sit in high places in the synagogues, while, at the same time, they are devouring widows' houses, and, for a pretence, making long prayers; and they shall receive *περισσότερον κρίμα* (*perissoteron krima*) "judgment above the ordinary amount" awarded to extortioners and others who injure the defenceless, but without making such a pretence of religion. But this sense is not conveyed by the words "shall receive greater damnation," as at present understood, and the employment of "larger dome," as used by Wycliffe, of "greater judgment," as used in nearly all the foreign translations, or of "judgment above the ordinary amount" as here proposed, would convey a more accurate sense of the original words, and a more correct impression as to the nature of the condemnation really implied by the speaker.

It is not easy to form a judgment upon what principle the word "damned" has been adopted in the authorised version in translating the Epistle to the Romans, xiv. 23, where Paul is writing about eating meats offered to idols. "Condemned" is the word generally used in the authorised version for *κατα-κρίνω* (*kata-krino*) in this epistle, and Paul uses that word when he says that any one who eats of sacrificial meats, and is doubtful while so doing whether he is doing right, is "condemned" (xiv. 23) by his own conscience—for whatever is not done with a full confidence in its rectitude, is wrong. But the authorised version, in this case, has it "he that doubteth is *damned* if he eat," an employment of the word which forms an exception in this epistle not easily to be accounted for, and one open to misconception in this case, as in the others already pointed out.

In writing to Timothy, and giving him directions for his guidance in various matters which might require his decision as Bishop of the Church, Paul speaks about the second marriage of widows, which upon the whole he discountenances. But he says (1 Tim. v. 11 to 15) that if the age and other circumstances of a widow, and the absence of those domestic duties which occupy so much of a married woman's time and thoughts should lead her to become a gossip and busybody, and otherwise render a second marriage desirable, let her marry again; but such persons, he says, have a judgment in store—*κρίμα* (*krima*)—because they have left their first faith. It was one of Dr. Johnson's cynical remarks that no man ought to marry a widow, unless her first husband had been hung or had committed some great crime; for if not, the memory of her first faith would, at times, return upon her so strongly as to be prejudicial to the comfort of her second husband, as well as her own. We may still hear the expression used by women, when speaking on this question, "that no woman who is faithful to the memory of her first husband

could take a second ;” and Paul alludes to this feeling when he says that the widow, in marrying again, carried judgment with her for leaving her first plighted faith. Still, he admits that the younger widows should marry again, and acquire home interests and duties, so that they may be domestic and virtuous, and give the adversaries of the Christians no ground for reproaching their conduct. When, however, the *κρίμα* (*krima*), thus described by Paul, is translated “having damnation, because they have put away their first faith,” the term, as at present understood, is inappropriate to the circumstances, and is calculated to convey an erroneous impression.

The words “damnation” and “damnable” are employed in the authorised version, in translating two passages in Peter’s second epistle, where he is speaking of false teachers, who would bring in “destructive heresies,” or “heresies of perdition,” for they would “deny their Master who bought them,” and would thus *destroy* the grounds of hope which Christians entertained, and leave them to the *perdition* from which their Master came to save them. And, he adds, that for such false teachers themselves judgment—*κρίμα* (*krima*)—would not long wait, nor would their own “destruction”—*ἀπώλεια* (*apoleia*)—slumber. But the translation of these heresies, so *destructive* of the Christian’s hopes, by the term “damnable” heresies, conveys an impression foreign to the original, and is without support from any other translation of the New Testament, except a portion of the English versions. Wycliffe translates it “sects of perdition,” and so do all the foreign versions we have compared, except the Irish. The Vulgate, the French, Italian, German, Spanish, Welsh, and modern Russian, all have words implying the loss, injury, or ruin resulting from the erroneous teaching, but nothing corresponding with the sense now attached to the word “damnable.”

HYPOCRITES.

mans eter ii. 1.	Matt. xv. 7 and xvi. 3.	Luke xii. 56.	Luke xiii. 15.
<p>α λήψο ἀπωλείας il receiple heresies tion</p> <p>of perdicoun inationle sects or es of perdition inations of destruc-</p> <p>demnat githa (— ent—co tion)</p>	<p>ὑποκριται hypocrites</p> <p>hypocrites</p> <p>hypocrites</p> <p>hypocrites</p> <p>hypocrites</p> <p>absent</p> <p>liceteras—dissemblers feigners—imitators— not interpreters or diviners</p>	<p>ὑποκριται ye hypocrites</p> <p>ye hypocrites</p> <p>ye hypocrites</p> <p>ye hypocrites</p> <p>ye hypocrites</p> <p>absent</p> <p>liceteras—dissem- blers</p>	<p>ὑποκριτα thou hypocrite</p> <p>ipocrite hypocrite</p> <p>hypocrite hypocrite</p> <p>absent</p> <p>licetara</p>

PROPOSED CHANGES SUPPORTED OR NOT SUPPORTED BY
OTHER VERSIONS OF THE NEW TESTAMENT.

In the case of this word "damnation" and its allies, we derive great assistance from other translations in the New Testament itself, and also from the translations in other languages. In fact, it is the exception, and a somewhat rare exception, for damnation to be employed, even in the authorised version itself, and the consensus of interpretation in other languages is almost universal against any word implying eternity, or those spiritual penalties supposed to be involved in the word "damnation." *Κρίμα* (*krima*) occurs in the New Testament twenty-eight times, and in twenty-three of these cases it is translated as "judgment," meaning "punishment;" "judgment" meaning simply "trial," which may end either in acquittal or condemnation; "judgment" meaning "sentence and condemnation;" "judgment" meaning "wisdom." "How unsearchable are his *judgments*, and his ways past finding out," and, also, "going to law," however that may result; and it is only translated "damnation" in the five cases which are brought before your criticism. *Κρίσις* (*krisis*) occurs forty-eight times in the New Testament, and is only three times translated as "damnation;" and *κατακρίνω* (*kata-krino*) occurs nineteen times, and in only three instances is it translated by that word. The oldest of the English versions—Wycliffe's—employs the word "dome" "trespas," or "perdition," in *seven* out of the *eleven* instances in which "damnation," or some similar word, is used in the authorised version; and among other languages even the Vulgate employs some form of "damno" in only a third of the instances in which that word is used in the authorised version. In the other cases it uses "judicium," judgment, or some word differing from "damno." The nearest approach to it, in any case, in the Italian, Spanish

or French, is "condemnation." The Welsh, with a single exception, uses words implying "judgment," or "loss," or some sentence related to the circumstances of the case. Bedel's Irish translation having been made by that Protestant Bishop, with the aid of two Irish friars, naturally bears the impress of the Vulgate, with which they had so long been familiar, and the Irish words employed are some form of *damno*, with an Irish spelling, or an Irish termination. The Gothic gives us but slight help, owing to the loss of so many chapters, but the Anglo-Saxon version, which was commenced, at any rate, by the Venerable Bede, in the 7th century, employs *dome* or *penalty* (*fine*) in each case.

The ancient Slavonic uses *sǫd*, or some derivative, meaning "condemnation;" the modern Russian uses *osoushdeanyah*, which is translated by "condemnation," and the Syriac Gospels of the 5th century employ "judgment" in every instance.

ὑπο-κρίτης—hypocrites.

Turning now to *ὑπο-κρίτης* (*hypokrites*), we find that it differs from *κρίτης* (*krites*) in the prefix of the preposition *ὑπο* (*hypo*), although both alike are translated "interpreter, diviner," while *ὑπο-κρίτης* (*hypokrites*) alone has the further meanings of "actor, stage-player," and, later still, of "pretender, dissembler, hypocrite," with the last of which meanings the ordinary English reader is the most familiar of all. What, then, is the value or force of *ὑπο* (*hupo* or *hypo*) in combination, which shall convert the harmless "interpreter" into the "actor," who may be good or bad, and the "hypocrite," who is always base and contemptible? *ὑπο* (*hypo*), meaning in itself simply "under," conveys different and apparently conflicting significations when in combination, and one of these is, in the highest degree, laudatory, while the other is depreciatory, to say the least of it. Thus, in our own

common language, we talk of what is "under" a building as its "foundation," and rightly consider it in many respects as being the most important part of the whole—as being essential to its stability and safety. So, also, we look carefully to what *under-lies* an argument, or a judgment, as being of primary importance. In such cases, therefore, "under" is a term of high commendation. But, on the other hand, we well know the depreciatory sense in which a person is said to be "*under-bred*," or a performance of any kind to be "*under the mark*." Now, the Greek language supplies us with innumerable examples of the employment of *ὑπο* (*hypo*), "under," in both these senses, of which I will give only one or two illustrations.

βαίνω (*baino*) is to "go," "walk," "step," but *ὑπο-βαίνω* (*hypo-baino*) is to "stand under," "as a prop, or base," or foundation, when the *ὑπο* (*hypo*) is an expression of value; while the very same word is employed in other instances to indicate inferiority; for one of the pyramids is described as *ὑπο-βάς* (*hypo-bas*), "going under," "being inferior or lower," by forty feet, than the other.

δείγμα (*deigma*) is simply "a sample or example," but *ὑπο-δείγμα* (*hypodeigma*) is "a pattern or example;" *δεχομαι* (*dekomai*) is simply to receive, but *ὑπο-δεξια* (*hypodexia*), *ὑπο-δεξις* (*hypodexios*) and *ὑπο-δοχη* (*hypodochē*), are the reception and means for the entertainment of a guest in a "capacious," "ample," and "hospitable" manner, differing from simple *δεχομαι* (*dekomai*), to "receive," in implying capacity and liberality by the prefix *ὑπο* (*hypo*)—going to the very foundation of what a host ought to be—i.e., both willing and able in his hospitality. *ὑπο-νοια* (*hyponoia*), "the true meaning which lies at the bottom of a thing," and *ὑπο-στασις* (*hypostasis*), "the ground-work," "substance," or "essence of a thing," may conclude these honourable consequences of the prefix *ὑπο* (*hypo*).

The word "hypothesis," ὑπο-θεσις, has become completely an English word in daily use, to indicate what is put forward as the basis or foundation of what we desire to be accepted in argument or in scientific explanation.

On the other hand, the instances are innumerable in which ὑπο (*hypo*) is employed to indicate inferiority in some sense, though not always a bad one; thus Βήσσω (*besso*) is to cough, but ὑπο-Βήσσω (*hypo-besso*) is only to "have a slight cough."

Βρεχω (*breko*) is to moisten; but ὑπο-Βρέχω (*hypobreko*) is "to drink moderately," and ὑπο-βεβρεγμενος (*hypo-bebregmenos*) is "to be slightly drunk."

Γελαω (*gelao*) is to "laugh," but ὑπο-γελαω (*hypo-gelao*) is to "laugh gently or smile."

Στρατηγος (*strategos*) is a commander or general, but ὑπο-στρατηγος (*hypo-strategos*) is a "lieutenant," not a full general.

Καμπτω (*kampto*) is to "bend a thing," and is an indication of strength in nearly all its significations, but ὑπο-καμπτω (*hypo-kampto*) is to "bend under," "to fall short of," to "fall below the mark."

ὑπο-μείων (*hypo-meion*) is "inferior," and "its substantive form of" ὑπο-μείονες (*hypomeiones*) was used among the Spartans to indicate the subordinate citizens in opposition to the ὅμοιοι (*homoiōi*), the full citizens.

In many cases, however, the signification of ὑπο (*hypo*) is decidedly bad.

Λείπω (*leipo*) is to "let go," "leave behind," "bequeath," but ὑπο-λείπω (*hypoleipo*) is to "fall short of what one expects."

Πιπτω (*pipto*), "to fall," ὑπο-πιπτω (*hypopipto*), "to fall down before any one," "to cringe," "to fawn on."

ὁραω (*orao*) is simply to "look at," but ὑπο-πτος (*hypoptos*), derived from it, is "looked at with suspicion or jealousy."

Τεμνω (*temno*), "to cut," ὑπο-τεμνω (*hypotemno*), "to cut unfairly."

Τρεχω (*treko*), "to run," ὑπο-τρεχω (*hypotreko*), "to run

between one's legs," "to intercept," "to insinuate oneself into any one's good graces," "to flatter," "deceive."

ὕπωπιαζω (*hypopiazo*), from ὑπο (*hypo*), under, and ὤψ (*ops*), the eye, is used in a sense that implies strength and energy, no doubt, but whether this energy has a good or a bad signification may be a matter of doubt. "Under the eye" is the literal meaning of the compound word, but its ordinary sense "is to strike one under the eye," "to beat one black and blue," and, in a derivative sense, "to vex or annoy one greatly."

Finding, then, how many different significations ὑπο (*hypo*), "under," conveys when in combination, we must now enquire whether it conveys a good or a bad meaning when combined with κριτής (*krites*), and whether it makes the simple "judge," "interpreter," or "expounder of dreams," into a "wise or an unwise interpreter," an "honest expounder," or a "pretender," or "hypocrite."

In this enquiry, we find an analogous word, ὑπο-φῆτης (*hypophetes*), also an interpreter; but, more than this, "an interpreter of the Divine will," "a priest who declares an oracle." φημι (*phemi*), by itself, means simply to speak, express one's own thoughts, and hence to "be of opinion," to "believe," "think," "imagine," but, with the ὑπο (*hypo*), "under," prefixed, it is converted into speaking "under" some higher power; speaking not one's own thoughts, but those revealed to us by the higher being; being, in short, an inspired speaker; an interpreter of the Divine voice; an expounder or declarer of the oracle. In this instance, ὑπο (*hypo*) gives dignity to the office of the ὑπο-φῆτης (*hypophetes*), but in the case of the ὑπο-μελῶνες (*hypomeiones*), the subordinate citizens in Sparta, the prefix is a sign of inferiority. We have therefore still to enquire whether the ὑπο-κριτής (*hypokrites*) was better or worse than the simple κριτής (*krites*) as an interpreter or diviner; and, as the result of my own research,

aided by classical friends, I have not found any classical authority for his being either higher or lower in his qualifications than the simple *κρίτης*. We have, therefore, to enquire in what respect they differed.

κρίτης, a "judge" of the words and actions of others, by the prefix *ὑπο* (*hypo*), becomes *ὑπο-κρίτης* (*hypocrites*), not only an interpreter of them, but also an exhibitor of them in public, and thus an "actor." But since in the representation of sentiments, which are not our own, there is always a danger of unreality; the word, when made into an adjective, signified among the Greeks an "exaggerated" "ranting style," such as what we ourselves are sometimes accustomed to call "theatrical." Exaggeration and rant, however, are mistakes, not immoralities; but, from exaggeration when trying to please others, it is an easy step to pretence and deception in order to answer our own ends, and then we have the pretender and deceiver. And thus from a simple "mistaken interpreter," or a "poor actor," which may arise from ignorance of the true meaning of the original, or from inability to represent it, we arrive at an intentional attempter to deceive—"a hypocrite."

Whether a pretender is blamed or praised will depend upon the tone and character of the public opinion of the time. There have been times and places, and it is said that such still exist, in which pretence and deception are not blamed, but are rather praised, if only they accomplish their objects and are successful. Successful pretence, successful deception, and even fraud, if successful, are regarded as clever sharpness, and are secretly admired rather than honestly condemned; and it is only if the pretence and deception are wanting in cleverness, and, still more, if they are wanting in success, that they are *bonâ fide* repudiated and condemned. The moral delinquency which is implied and reprobated by the term "hypocrisy," has not in fact been universally dis-

countenanced, and the word "hypocrite," with the signification now attached to it, is not of classic origin, but is to be traced to the Septuagint, and still more completely to the New Testament, in which it occurs so frequently as to be one of the most familiar of words and of description of characters for the last eighteen hundred years at any rate.

We are now in a position to examine the instances in which the word is used in the authorised version of the New Testament, and to judge whether, in its almost universally received signification, it is correctly applied in every case. In most instances the moral deception condemned is so palpable, that no doubt can exist as to its applicability, but there are two or three cases to which I desire to ask your attention, and to propose a substitute.

To blow a trumpet and parade their giving of alms, in order "to be seen of men," is at once recognised as hypocrisy, but it has been questioned whether the "praying standing in the synagogue and in the corners of the streets" was hypocrisy, for the Mahomedans pray publicly, and in a loud voice, and no one thinks of calling that hypocrisy. The obvious answer is that they do so in obedience to what they regard as an imperative obligation, and the publicity of their devotions is not for the purpose of being seen of men, but of discharging an imperative duty. No one who has travelled much in steamboats and railways, in recent times, can have failed to meet with members of a religious community who, at intervals, in the steamboats or in the public carriages, cease conversation and turn to their devotional books; but no one, even mentally, accuses them of hypocrisy, because it is so well known that they are merely acting in obedience to the rules of their society. But if any one not acting under a manifest sense of duty were to adopt such a practice, he would probably be regarded as doing so "to be seen of men," and would not unrightly be set down as a hypocrite. But the

following cases are not so self-evident, and the application of the term "hypocrite," in its ordinary acceptation, does not appear to be free from doubt.

In the 13th chap. of St. Luke's Gospel, an account is given of Jesus healing, on the Sabbath day, a woman who had been bound for many years by some infirmity, and the narrative relates that the ruler of the synagogue upbraided the woman and the people for coming on the Sabbath day to be healed, and by implication blamed the beneficent author of the cure, who is related to have made the rejoinder—"Thou hypocrite! doth not each one of you loose his ox or his ass on the Sabbath, and lead him away to watering; and ought not this woman, a daughter of Abraham, still more to be loosed from her bond on that day?"

Now, when we remember that the original word ὑποκριτής (*hypokrites*) means primarily an "interpreter" (though this may be either a well-informed or an imperfectly informed interpreter), and is only secondarily a term implying moral blame, the question in this case arises whether the ruler of the synagogue was an honest, but an imperfect interpreter of the law, or a dishonest man, pretending to righteousness that was only pretence. Now, the narrative itself says that the ruler "answered with indignation," an expression which seems to convey (in the absence of anything to the contrary) that it was *bonâ fide* indignation—not mere pretence; and the narrative itself makes no imputation of unworthy motives in the case of this man. The whole of the Gospel history shows how deeply seated, at that time, was so-called Sab-batarian strictness, among the Pharisees and many others in authority in the synagogues, and it seems really more probable (having regard to the time and the place) that this ruler of the synagogue was honestly startled and shocked by this disregard of his life-long belief, and was honestly filled with indignation, rather than that he was showing indignation

which he did not feel. In reproving him, the Greek word *ὑποκριτής* (*hypokrites*) was, no doubt, employed; but this does not necessarily imply dishonesty or pretence; and, if we accept the above view of the circumstances, the narrative will then run—"Oh! thou interpreter of the Divine law—does not each one of you loose his ox to water him on the Sabbath, and is not this woman—this daughter of Abraham—more worthy than an ox; and ought she not, therefore, still more to be loosed from her infirmity?" The apparent bitterness of the denunciation is absent in this interpretation, and as it appears also to be more consistent with the circumstances, I submit it to your consideration.

In two other instances recorded by the same author (Luke vi. 7, xiv. 1), it is premised that the Pharisees were watching Him in order to lay information or to create prejudice against Him; and in these cases their thoughts were challenged and their motives exposed, which places them on a different footing from the ruler of the synagogue, in the narrative we have been considering.

In the 23rd chap. of St. Matthew's Gospel are many denunciations of the "hypocrisy" of the Scribes and Pharisees, which, on perusal, will be seen to be associated with dishonesty or pretence in nearly every instance; but there is one remarkable exception which occurs in the very middle of the chapter (verses 16 to 23) which seems to give countenance to the interpretation proposed above. The Scribes and Pharisees are in this case upbraided for saying that whoever should swear by the temple it was nothing, but whoever should swear by the gold of the temple was bound by it. Now, in this case, there is no necessary dishonesty implied in saying that the gold was more important than the temple, as giving sanction to an oath, for we meet with instances every day, in which even honest persons attribute more weight to trifles and externals than to the essentials which the externals

only represent. And the reproof, in this case, is not "ye hypocrites," which has been used throughout the chapter in denouncing the moral faults dwelt upon, but "ye blind guides." Their ignorance is blamed, not their "hypocrisy" in this instance; and similar ignorance seems fairly to have been the condition of the ruler of the synagogue.

In another instance (Matt. xv. 7, Mark vii. 6), where a discussion is recorded, in reference to the washing of pots and cups and other ceremonial, the Scribes and Pharisees are again reproved, as *ὑποκριταί* (*hypocritai*), in Matthew's narrative, though no such term is applied to them in Mark's account; but in both cases they are reproached for their erroneous interpretation in representing that externals were the essentials to be insisted on, not the inner cleansing of the soul or character; and the account closes with the explanation: "they be blind leaders of the blind;" in other words, "ignorant or mistaken interpreters," rather than the moral delinquents implied by the modern sense of the English word "hypocrites."

There is another passage in which the term "hypocrites" appears to be more naturally translated by "diviners," or by "defective diviners," than by "hypocrites," for moral considerations are not the principal subjects under discussion. In Matt. xvi. 3, in Mark vii. 6, and in Luke xii. 56, the demand is made that Jesus would show them a sign from Heaven as a proof of His authority and His mission, and the answer is a reference to the appearances of the sky, as indicating the future weather. And the conclusion in Matt. is—"Oh, ye hypocrites! ye can discern the face of the sky; but can ye not discern the *signs of the times*?" Mark vii. 6 simply says that "He sighed deeply in spirit," and said no sign should be given. But in Luke xii. 56, He is again related to have said—"Ye hypocrites! ye can discern the face of the sky, but how is it that ye do not discern this

time?" Now, shortly after this follows the pathetic lamentation over Jerusalem, the signs of whose coming destruction these "diviners" of the weather could not see. They were still such "imperfect diviners" of the signs of the times, that "that day did come upon them unawares," and involved them in the ruin so pathetically foretold and bewailed.

In the investigation of this question, I am bound to acknowledge that the proposed changes derive but little countenance from the other versions of the New Testament; for all the English versions, the Vulgate, and the languages derived from Latin, the Italian, the French, and the Spanish, all adopt the Greek word hypocrite, and simply convert it into their own language by such alterations of letters as are in accordance with the custom of their tongue. Thus, the Vulgate changes the spelling into Roman letters, and alters the final η into α . The Italians, not liking aspirates any more than some of ourselves, drop the "h," and convert hypocrites into *ipocriti*; and similar unimportant differences are made in French and Spanish. The German, which is not derived from Latin, employs the word *heuchler*, "deceiver," in every case in which hypocrite occurs in the New Testament, and it does not help us. In Welsh the word is also translated in every case into something implying deception, or else into simple hypocrite, spelt according to the fashion of the nation. In Irish the word used implies "cold-hearted." Ulfilla's Gothic Gospels of the 4th century do not help us; for the passages in question are in those portions of the Gospels which are lost. The Anglo-Saxon of the 7th century uses *liceteras*, which means "dissemblers," "imitators." The ancient Slavonic employs *litsemyeri*, "hypocrites;" the modern Russian uses a word meaning "face-measurer," and the Syriac of the 5th century employs a word meaning "acceptors of persons." I can therefore only submit the proposed changes to your consideration,

to be judged of according to the special features in each case.

HEBREW—WITH REFERENCE TO “HYPOCRITE.”

Rabbi Praag has favoured me with the following commentary on the Biblical use of the term “hypocrites” in the Old Testament :—

“Biblical Hebrew has (according to Gesenius, A.O.) no equivalent term for the word hypocrite.”

“The Vulgate, in several places, renders the Hebrew *חָנֵף* *chanef* “hypocrita,” and the Septuagint, in two places, ὑποκριτής; but this is drawn from Rabbinic usage. *Chanef*, wherever found in the Hebrew Scriptures, means profane, defiled, wicked—not pretender or hypocrite.”

“The class of hypocrites who had connected themselves with the Pharisaic sect, are, in post-biblical writings, branded with the name *Zabuim*, i.e., dyed or painted ones—*such as appeared under false colours.*”

“It is related in the Talmud (Tract. Sota., p. 22) that Alexander Jannæus (about 100 B.C.), who, during his life-time, persecuted the Pharisees and massacred many of them, in his dying moments, strongly urged his wife and successor, Alexandra, to throw the administration of the empire into the hands of the Pharisees. On expressing her fear to adopt this policy, on account of the enmity prevailing between them, the dying king said—“Be thou not afraid of the Pharisees, nor of any other sect; beware only of the *Zebuim*, for they commit the wickedness of Zimri, and, at the same time, claim the reward of Phinehas. (Numbers xxv.)”

“Pharisees (Parushim) signifies *separatists*, from Parash, the Hebrew word for ‘to separate, to keep aloof.’ They added to the law the traditions of the fathers, were strict believers in the immortality of the soul and the resurrection of the dead, and led an austere and abstemious life. The conduct

of the majority of them is, however, much blamed by the Rabbis. The Talmud divides them into seven classes, of which the first five were such who minutely observed ceremonies and absurd practices, from no other motives than pride, ambition, hope of reward, &c., &c., and may justly be named *hypocrites*; the latter two classes had no other design than to devote the whole of their lives to the service of God, and to love and to fear Him with all their might."

BIBLICAL CONTENTS OF THE LIVERPOOL FREE LIBRARY.

There is a wealth of Eastern versions of the New Testament contained in the Free Library, in this city (Liverpool), which is so much indebted to our valued ex-presidents Mr. Picton and Mr. Higgins, viz., the Old Slavonic, the Syriac, the Armenian, the Bengali, the Bulgarian, the Albanian, the Coptic, the Kurdish, the Judæo-Arabic, and the Judæo-Persian; but, unhappily, I am not acquainted with either the characters or the meaning of these languages; and I have not yet met with any one who can unlock their treasures; so they must be reserved for a future time, and a more learned or a more fortunate member of this Society. It may, however, be stated generally that the English versions, beginning with Tyndal's and ending with the authorised version, stand in an isolated and exceptional position in their employment of the word "damnation," but agree with other languages generally in their employment of the word "hypocrite," or some equivalent term.

In conclusion, then, I submit to your criticism the changes of translation suggested in the following table:—

REFERENCE.	AUTHORISED VERSION.	SUGGESTED CHANGES.
Matt. v. 22	"Danger of hell-fire"	"Gehenna of fire."
" xv. 7	"Hypocrites" ...	"Interpreters" <i>of the law</i> .
" xvi. 8	"Hypocrites" ...	"Diviners."
" xxiii. 14	"Greater damnation"	"Judgment beyond the ordinary" <i>amount</i> .
" xxiii. 33	"Damnation of hell"	"Sentence of Gehenna."
Mark iii. 29	"Eternal damnation"	"Eternal judgment."
" xii. 40	"Greater damnation"	"Judgment beyond the ordinary" <i>amount</i> .
Luke xii. 56	"Ye hypocrites" ...	"Ye diviners" (or weather prophets.)
" xiii. 15	"Thou hypocrite" ...	"Thou interpreter" <i>of the law</i> .
" xx. 47	"Greater damnation"	"Judgment beyond the ordinary" <i>amount</i> .
John v. 29	"Resurrection of damnation"	"Resurrection of judgment."
Rom. iii. 8	"Damnation is just"	"Condemnation is just."
" xiii. 2	"Receive damnation"	"Receive judgment."
" xiv. 23	"Is damned if he eat"	"Is condemned (<i>by his own conscience</i>) if he eat."
1 Cor. xi. 29	"Eateth and d. damnation"	"Eateth and d. condemnation or judgment."
2 Thes. ii. 12	"Dannned who believe not"	"Judged who believe not."
1 Tim. v. 12	"Having damnation"	"Having judgment" <i>in store</i> .
2 Peter ii. 3	"Damnation slumbereth not"	"Destruction slumbereth not."
" ii. 1	"Damnable heresies"	"Heresies of a destructive character."

9

NOTES ON EASTER ISLAND.

By ALBERT J. MOTT, F.G.S.

IN a paper on the Origin of Savage Life, printed in the Society's volume for 1874, I drew attention to the peculiar facts relating to Easter Island, and to certain inferences which seemed necessary ones. The views thus advanced have been accepted as sound by some high authorities, but they are opposed to what are still the current theories of modern anthropology, and they became the subject of a brief criticism by Mr. H. N. Moseley, F.R.S., of the "Challenger" expedition, in *Nature*, October 23rd and November 13th, 1879.

Mr. Moseley's views are partly founded on the statements of a French traveller (M. Pinart) who visited Easter Island in 1877, and whose account of it was published in the *Tour du Monde*, October, 1878. The questions at issue are important in more ways than one, and, in the present state of the discussion, the subject deserves, I think, to be brought again before our members. The reasoning on which my own views have been formed is briefly as follows:—Easter Island, when peopled by savages and left to itself, is entirely cut off by distance from any communication with the rest of the world. The area of the island is not more than 40 square miles. Fifty inhabitants to the square mile may be taken as the utmost limit of the number that can be supported, as savages, on an isolated island without any external help. There is no known example of a population so dense as this under such conditions, and the results of rude labour, always limited to the same small area, could barely yield the necessary food. In a savage state, therefore, the inhabitants of Easter Island

can never have exceeded 2,000, of whom about 500 would be adult males. It is not likely that this number has ever been reached, or that, if reached, it could ever be maintained for many years together. This island contains a great number of colossal stone images. They are among the largest and heaviest in the world. They have been cut from the rocks, removed to considerable distances, and set upright upon stone terraces built to receive them.

It is not credible that work of such magnitude could be accomplished by so small a population, with no tools or mechanical help except such as they themselves made from wood, shell, or stone. Nor is it credible that such a handful of human beings should ever voluntarily undertake or continue the work while in the condition of savages.

It follows, therefore, that the island must have been within reach of external assistance when this work was done, and as this could be given only by crossing one or two thousand miles of sea, it follows also that the help came from some race possessing sufficient skill to navigate the ocean. This necessarily involves the belief that the former inhabitants of Easter Island, when the stone images were made, were considerably above the level of savage life, and that the recent inhabitants, if descended from them, have become savages by degradation.

As to the place from which external help would arrive, the inference from the facts is no longer a necessary one, but all probability points to the American continent. There is absolute proof in the mounds of the United States, in the ruins of Central America, and in the antiquities of Peru, that this great continent has been inhabited by ancient races with sufficient intellect and power to become skilful navigators, if their energies were turned in that direction. There is at present no direct evidence of such a fact, but there is no inherent improbability.

Mr. Moseley has attacked the whole of this reasoning on the following grounds :—

1st.—That the evidence is brought forward in proof of a former general advanced intellectual condition of mankind, as opposed to the accepted scientific position that primitive man was savage.

2nd.—That I have drawn conclusions with regard to the ancient navigation of the Pacific, and a former condition of high civilisation of the erectors of the stone images, which will not be admitted by any scientific ethnologist.

3rd.—That the difficulties attending the erection of large stones by savages, or very slightly civilised people, all over the world, have been greatly overrated.

4th.—That the latest observer, M. Pinart, finds no difficulty in accounting for the erection of the images, and fully explains the method.

5th.—That as many as 500 men would not be required for their erection.

6th.—That there was a good deal of wood in the island formerly, and that it would be used for rollers and levers.

Lastly.—That the idea that a former nation existed which navigated ships to Easter Island at regular intervals, and kept the place going as a colony, will be regarded as simply absurd by any one who knows anything of the science of navigation, because so small an island could only be reached by means of a very advanced knowledge of astronomy and navigation, with the help of instruments of great precision. No Chinese, Japanese, Indian or Arab navigators could have hit on the island except by accident. An exact determination of longitude, as well as latitude, is involved in the matter. A mere knowledge of the compass, and its variations even, would not avail. Mr. Moseley adds examples of the difficulty experienced by even skilful navigators in finding detached islands at the present day. These objections embody the

views that are current on the subject, but they are founded on a misconception of the nature of the adverse evidence, and of those conclusions by which they must, I believe, be ultimately supplanted.

You will see that Mr. Moseley's criticism begins with a curious mistake. No theory of a former general advanced intellectual condition of mankind has been brought forward by myself, nor are the views I have expressed either opposed to, or in favour of, any theory whatever concerning "Primitive Man," if that phrase refers to human beings in their earliest condition on this earth. The whole purport of the paper on the Origin of Savage Life was to show that as far as our real knowledge of human life extends backwards in the past, the world has always contained, as it does now, civilised races in some places, and savage races in other places, but that we have at present no knowledge of any kind concerning any period that can be properly called the era of "Primitive Man." And I have uniformly objected, and cannot too strongly emphasise the objection, to the claim of any theory on the subject to be called a "Scientific Position." Where we have no knowledge we ought to have no dogmas, and the leaders of science ought to refuse to stamp the words, "Scientific Position," on that which is known to be incapable of proof, however strong our belief in it may be.

Mr. Moseley's error on this point, however, does not affect the rest of his views, which raise the questions that have really to be discussed. He states then that it would not need five hundred men to erect the Easter Island images, and that M. Pinart has explained how it was done. This is the essential part of his criticism, and the statement of the objection in this form shows how very little the evidence has been considered, or its real force weighed, by modern anthropologists. For the *erection* of the images is only a small

part of the work that has been accomplished, and the force of the evidence lies entirely in the magnitude of the whole. Anyone looking at a large cathedral would say at once that six men left to themselves could never have built it. And yet there may be no single stone in the building that could not have been put in its place by six men, with the help of some simple machinery. Pinart's narrative, however, to which Mr. Moseley refers, is in some respects an important document. He spent several days upon the island, and an examination of his statements will dispose of nearly all the matter in debate. I must begin, however, by warning you that M. Pinart's paper contains two obvious mistakes. He describes a terrace built of stone in the island as having been originally 50 metres high, 200 metres long, and 10 metres wide. We may be certain that no such structure has existed there. A long stone wall 160 feet high would almost rival the famous walls of Babylon as a specimen of building power, and its discovery would multiply the wonders of the island twenty-fold. Pinart states, secondly, that the crater of Ranakau, an extinct volcano, is about 800 metres deep. If so, the bottom would be 1,200 feet below sea-level, for the mountain is only 408 metres high. We know, on better authority, that the depth of this crater is not 800 metres, but from 600 to 700 feet. These errors, in so short a descriptive narrative, throw great doubt on the writer's accuracy, and where his statements support my own views, I shall not rely upon them.

Mr. Moseley's special reference is to Pinart's supposed explanation of the way in which the masses of stone composing the images were separated from the rock, and set upright in the interior of one of the craters.

Pinart says as follows:—

“Taken altogether, this vast manufactory of gigantic statues, some quite finished, some rough-hewn and in course

of execution, enables us to understand the method by which the work was accomplished and the mode by which the statues were set upright and in their places when complete.

"The execution of this work, which at first sight appears considerable, which has so greatly astonished travellers and suggested so many hypotheses, is, however, a matter of great simplicity.

"In carving their statues, the sculptors always chose a rock placed on a slope; they cut the figure on this rock as it stood, and did not try to detach it till this was finished. They must then have pierced underneath it a multitude of holes about 8 centimetres (3 inches) in diameter, as we were able to establish. The statue once separated from the parent rock, it was easy to make it slide down the natural slope to the place intended for it. There the ground had been previously excavated to a depth sufficient to contain the body up to the bust, which alone stood above the surface; then, insensibly, without the employment of much force, the statue was raised by means of fragments of rock placed under it, forming thus an inclined plane, or rather an enormous wedge, of which the thickest side rested against the head of the statue, thus supported and raised; the excavation was filled up, the inclined plane destroyed, and the statue stood definitely erected."*

* "L'ensemble de ce vaste atelier de statues gigantesques, les unes entièrement terminées, les autres à l'état d'ébauche et en voie d'exécution, nous permit de nous rendre compte de la façon dont le travail était accompli et de la manière dont elles étaient érigées et mises en place après leur complet achèvement.

"L'exécution de ce travail qui de prime abord paraît considérable, qui a tant étonné les voyageurs et suggéré de nombreuses hypothèses, est cependant d'une grande simplicité.

"Les sculpteurs choisissaient toujours pour tailler leur statues une roche placée sur un plan assez incliné; ils la façonnaient dans cette roche même, sur place, et ce n'était qu'après l'avoir terminée qu'ils s'occupaient de l'en détacher.

"Pour arriver à ce résultat il fallait percer parallèlement en dessous une

This is the account on which Mr. Moseley relies, and it is surely surprising that he should do so. For this is no statement of facts carefully observed. It is a statement only of a traveller's opinions; a traveller, moreover, who has described an impossible wall and an impossible crater. What did M. Pinart really see? He does not tell us. He tells us only what he "was able to establish"—("nous avons pu le constater"). Did he find these holes and these excavations, or is it all an inference or a guess? Nothing more unsatisfactory has ever been presented as a solution to a difficult inquiry. Pinart has had the rare opportunity of making and communicating exact observations on a matter of great interest and in a spot generally inaccessible, and he uses it in this way. I do not think our members will feel that much can be settled by Pinart's evidence.

The mode of sculpture here suggested must be considered in detail. The choice of sloping rocks that could first be carved *in situ*, and then detached and slid down the mountain side, involves a perfect understanding of all that had to follow, and an extraordinary confidence in the power of doing it successfully. A sculptor who will spend his time and labour in carving, on the face of a standing rock, an enormous image which he intends to remove to another place, must feel very sure that he can detach it and move it without accident, or he will certainly detach the rock first and carve it afterwards.

multitude de trous de huit centimètres environ de diamètre, comme nous avons pu le constater.

"La statue une fois isolée de la roche mère, il devenait facile de la faire glisser sur la pente naturelle jusqu' à la place qui lui était assignée d'avance. Là, le sol avait été préalablement creusé assez profondément pour contenir le corps jusqu' au buste, qui seul émergeait, puis insensiblement, sans un déploiement considérable de forces, elle était soulevée à l'aide de fragments de rochers que l'on disposait en dessous, formant ainsi un plan incliné, ou plutôt un énorme coin dont la base plus épaisse correspondait à la tête, ainsi consolidée et relevée; l'excavation était comblée, le plan incliné détruit, et la statue se trouvait définitivement érigée."

And projecting rocks suitable for such a purpose are found in nature only here and there. Straight blocks of stone 30 feet high or more, and of the thickness required by the sculptor, are scarcely to be found at all ready to our hands, and in almost every case, even of convenient projection, the stone must be cut out of a rock surface by considerable quarrying on both sides. Pinart himself speaks of a hollow in the face of one of the cliffs, large enough to shelter him and his companions, which he supposes to have been cut out to enable the sculptor to work at the back of his statue. What human hands have done this with stone implements, and what race of savages possesses the skill and knowledge here involved?

As to the supposed method of detachment after carving the image on the standing rock, it is easy to say, vaguely, as Pinart does, that you bore a number of holes through the rock, so as to separate the statue; that you then slide it down till you come to a hole ready made for it; that you gradually tilt it up over the edge of the hole till it stands upright, and then fill in the excavation. The fancy is pretty enough, but the real work is very different.

First as to the method of separation. These statues are of gigantic size. Pinart gives the measures of several. He makes one of them 65 feet long; another 45 feet; another 22 feet above the ground; the rest of it, probably not less in length, being in the ground. If they are 5 feet thick, which is probably less than the fact, the largest might weigh 100 tons, the others 60 or 70 tons.

Pinart's measurements much exceed those of other travellers, but there is no doubt that many of these images are at least 30 feet high, and weigh upwards of 30 tons.

Now, to detach a piece of rock even 30 feet high in the manner supposed, that is, by boring holes through it, 3 inches in diameter, 120 such holes must be bored. They cannot be less than from 4 to 6 feet deep. Has anyone considered how

these holes are to be bored through solid trachyte, with tools of wood and stone; or what time and labour would be required to detach a single statue? The necessary boring amounts to from 500 to 700 feet in total length—3 inches being the diameter. The only way in which holes of this kind can be bored is by the continued stroke of chisel edges or points upon the rock you have to cut away, and, in the case supposed, these could only be stone chisels fixed at the end of long wooden handles, worked by hand. The time and labour required would be perfectly prodigious, even if we admit the possibility of doing such work at all. Nor could the rock be entirely detached in this way; and the parts not severed by the boring must be cut away afterwards or broken by wedges or levers.

Suppose the statue separated, however. An excavation has then to be made, deep enough to bury about half of it. That is to say, a hole some fifteen feet deep has to be cut straight down in the side of a rocky mountain. We can hardly err in saying that such work, with such tools, is really impossible. This is no longer the detachment of a projecting piece of rock, but the digging out of solid stone downwards. Even if we suppose the surface to be covered with broken rocks to a sufficient depth—which is not suggested, however, by Pinart—such a deposit of *débris*, consolidated as it must be by the long period required for its formation, would be almost as hard to cut through as the rock itself. Of what avail are stone axes or wooden tools in such an operation?

Imagine the excavation made, however. A statue thirty feet long, and weighing thirty tons, has to be slid down to it, till it half overhangs the edge of the excavation—for this is the only conceivable way in which it can be got into it. This might possibly be effected by the help of wooden rollers and levers. But having got so far, in what way is it to be let down and at the same time raised to an upright position;

without ropes or chains? Pinart's account is here incomprehensible, and shows either a want of mechanical knowledge or an inability to express what is meant. It is raised insensibly, he says, by the help of fragments of rock put under it. How can you raise a weight of this kind by putting fragments of rock under it? You must raise it first, and then your fragments may be put under to keep it from falling back, but the power must be in something else. Suppose it is done with levers, and that you have built up a suitable fulcrum—no easy matter—while you raise the head of the statue the lower part is swinging in the air over the excavation, and what is to prevent it from slipping down, and either breaking itself in pieces or fixing itself in a sloping posture, which is just what you do not want?

Pinart's account of this operation is one of those statements that appear reasonable only while we make no inquiry into their practical details. With the machinery of civilised life, all that he speaks of could easily be done, but he gives us no clue to any real method available to savages.

A further question occurs, which it is strange that any traveller could have overlooked, though there is no reference to it in Pinart's narrative. What, after all, could be the motive for erecting statues in this way? According to Pinart's measurements and drawings, about half of the entire image is buried in the ground. All the labour of carving a figure thirty feet high is undertaken in order that the further labour of making a hole some fifteen feet deep, and putting the statue into it, may also be incurred. Those who could set such an object upright in an excavation, could certainly erect one, half the size, upon the surface of the ground. One cannot help the suspicion that if these statues are really buried to the depth described, this is due to the accumulated *débris* of ages round them, and not to the intentional work of

the sculptors; although this would seem to involve an antiquity which is not very probable on other grounds.

I must now point out a still graver objection to Mr. Moseley's reasoning. The images here spoken of by Pinart are all in the crater in which they were carved, and what he attempts to explain is only the supposed method of detaching them, and erecting them in that place. But my own reasoning did not refer to this. I spoke of the numerous statues, similar in kind and size to those in the crater, which have been erected, not on the sloping hill-side, but on the top of flat stone terraces built for the purpose in various places along the coast of the island. These have been removed to considerable distances from their quarries; not down inclined planes, but across the broken country, and have been set upright where no excavation was possible, and a totally different method must needs have been employed. No one yet has suggested any method by which this could be done by savages with no resources but those native to the island. Suppose one of these statues lying on the flat top of one of the terraces; in what way is it to be set upright? It is not here a question of the number of hands. Not more than ⁷ thirty or forty men at the utmost could touch the statue at the same time, and they could not stir it. The things wanted are ropes and scaffolding strong enough to bear a strain of several tons. Provide these, and there is no insuperable difficulty; but these are exactly what could not be provided.

The making and erecting of these statues is only part of the work which has to be accounted for in the island. Pinart's stone terrace, 160 feet high, may be dismissed without discussion, but Mr. Palmer, whom we all know, and whose measurements may be trusted, has described what is probably the same terrace, making its height about 20 feet. This structure would not contain less than ten thousand tons weight of material, and its outer wall is built of large slabs roughly squared.

What race of savages has ever set to work to move ten thousand tons of stone? A great part of the material has been carried from some distance. The remains of other terraces still exist, similar in size and structure. The island, in fact, is covered with the evidence of immense labour and considerable skill. To assume, seriously, that all this has been the voluntary work of an isolated tribe of one or two thousand savages, with no external help, no means of living but by their own labour, and no tools but such as they could make themselves, is to discredit the whole method of scientific inquiry in relation to the human race. The main facts are not matters of dispute. The habits and powers of savages have been studied with a good deal of care and in a great many places, but nothing at all resembling in magnitude the works at Easter Island is ever known to be attempted by them, even where they are very numerous and have metal tools in their hands. They are often found inhabiting places where remains of great buildings and other marks of heavy labour exist, but in all cases without exception they are ignorant of the origin of these things and incapable of imitating them. Mr. Moseley's view requires that all experience should be set aside, and that these islanders should be credited with powers possessed by no existing race under like conditions, rather than admit a difficulty in the way of a favourite anthropological doctrine.

I must take exception here to one passage in Mr. Palmer's narrative, in which he says :—

“The implement used for carving these statues was a long boulder pebble, from the shore, like a rolling pin or huge incisor. The chisel edge was produced by chipping it and rubbing it down afterwards on obsidian. We saw but one. This was presented to Commodore Powell, and is now in the British Museum.* It was noticed that on many of the

* This chisel is extremely well made, with long fine bevels on both

statues little projections were left. These were portions harder than the chisels." (*Proceedings Royal Geographical Society*, vol. xiv., p. 108.)

The statement is, of course, conjectural only. I believe it is physically impossible that the statues should have been carved in this way. It is for those who think otherwise to establish their position. No example can be produced of anything even approaching these images in size and workmanship that is known to have been executed with stone chisels; and if anyone will try what kind of impression he can make on rocks with such implements, and at what rate his tools are broken, I think the practical impossibility will be no longer in dispute.

The finding of a stone chisel in the island of course proves nothing either way. For many centuries, at all events, the recent inhabitants had nothing but stone to make tools of for any purpose, and the only thing at all remarkable is, that only one such chisel has been found. If experience is to guide our judgment, the size and character of the work is conclusive proof that metal tools have been used. Mr. Palmer's observation that on many statues little projections were left, which he supposes to be portions of the stone harder than the chisels, is not to be overlooked, but is, in no respect, opposed to this conclusion. Spots of great hardness, not easily cut even with steel, are common in volcanic rocks, and the tools are not likely to have been very good ones. There is nothing in the island to support the idea of what we now mean by high civilisation among its former inhabitants. What the evidence suggests is the existence of a strong, barbaric, energetic race, with abundant power, and skill enough to use it vigorously in the rough arts of life. The

sides. If made by hand-rubbing, it cost its manufacturer many hours, perhaps days, of hard work. It is well adapted for splitting wood, which no doubt was the probable object. The cutting end is broken off.

solitary stone chisel is again the strongest confirmatory evidence of the use of metal. For if the tools could have been of stone, a prodigious number would have been used, and broken and cast aside, and, as they would not soon perish on the ground, they ought to be seen in profusion. Metal, on the contrary, would become so valuable when the island became isolated, that we may be sure it would be carefully collected and would gradually disappear. But as in other cases where the use of metal has been at first denied and afterwards demonstrated, some objects made of it ought still to be in existence, and if a full examination of the island is ever undertaken, the search for these should be one of its first efforts.

Pinart says he found near the statues of the crater and in other parts of the island a great number of flakes of obsidian, cut into the form of knives, scrapers, lances, &c. (the etcetera is his own), and asks whether these could be the tools of the sculptors. He thinks it possible, but our confidence in his judgment will not be strengthened by this expression of opinion. Obsidian flakes, in the form of knives, scrapers, and lances, are assuredly not the implements required, though they are the natural work of savages for their ordinary purposes where the material is at hand.

The general conclusion that the work in the island could not be done without external help, leads us necessarily one step further. External help must have come, and therefore there must have been a nation somewhere able to convey it across the ocean.

Mr. Moseley thinks that this will be regarded as simply absurd by any one who knows anything of the science of navigation.

But on what ground will such a person form his opinion? The question is not how much knowledge was necessary. The question is whether the necessary knowledge was possessed

by some unknown nation at some unknown time. That is not a question to be solved by the science of navigation ; nor is it by any use of that science that any conclusion on the subject can be pronounced absurd. In fact, it is not as a sailor but as an archæologist that Mr. Moseley himself gives judgment in this way. He means that the necessary knowledge could not have been possessed by any unknown nation. This is a very common assumption. We are not far removed from an exceedingly unscientific state of general theory concerning the history of the world, and many of its traditions hang about us unconsciously. It has been supposed that we know the limits of earlier navigation, and that after considering what was done by the Phœnicians, Greeks, Arabs, Chinese, and Malays, we have exhausted the whole story of ancient naval enterprise. The assumption will have to be abandoned, for it rests on nothing but our own almost perfect ignorance of what occurred in the old world before there was a king in Egypt, and in the new world before the fifteenth century of our era.

Now, it is our ignorance of the history of the new world that is more particularly concerned at present. The age of the Easter Island monuments is very uncertain, but it is hardly probable that they are as old as those of Egypt ; and, if so, there is good ground for the belief, though not, even here, for the dogmatic assertion, that the needful help did not come to the island from the Eastern continent.

But what do we know about American history during the three or four thousand years in question ? We know, with certainty, that the greater part of North America was occupied at some former time by inhabitants probably as far above the Red Indian in civilisation as the ordinary Hindoo is above the wild hill tribes. And we know that Central America and the Pacific coast, southward, were inhabited four centuries ago by the nations conquered by the Spaniards—nations perfectly

civilised in the organisation of power and the possession of skill, and apparently at that time in a declining state from a higher condition. We know, also, that the former inhabitants of Peru were among the greatest workers in stone that the world has seen. They carved stone images as large as those in Easter Island; built cities, palaces, and temples of stone; made roads and aqueducts hundreds of miles long, cutting their way along the sides of precipices, building up embankments across valleys, and exhibiting in every way a complete mastery over work of this kind. And it is perhaps pretty certain that, while they used bronze tools, they had no iron ones. Our knowledge stops here. Where these races came from, who preceded them, or what was the limit of their civilisation, are things utterly unknown.

But wherever men are numerous, intelligent, and organised, and have acquired great skill and long experience in any kind of laborious workmanship, the direction in which their energies will be turned depends almost entirely upon the surrounding circumstances. If these at any time were such as to make sailors of the ancient Peruvians, they were as well qualified to become good seamen as any other race. A very long coast line on a tropical ocean, not generally stormy, with mountains so lofty and so near the shore that vessels may sometimes go a hundred miles or so out to sea without losing sight of land, offers special encouragement to early adventurers, and the certainty of reaching some part of their own country again by simply steering eastward from whatever distance, could not fail to give a sense of security in attempting longer voyages. Nothing, surely, is more likely than that circumstances of this kind would arise in the ancient history of America. How far the voyages of such a people would extend would then, of course, become a question of maritime skill and knowledge; but these have come everywhere as the fruit of experience on the sea, and are not the special property of

any particular race. The essential observations have been made from immemorial time in the old world. In clear tropical skies they would be self-suggested to any observant people, and in the long summer of these regions the skies are generally clear. Mr. Moseley dwells on the difficulty of finding a small oceanic island without modern instruments, and no doubt a search for it would often fail. But it is matter of fact not only that ships, 2,000 years ago, were accustomed to cross from the Red Sea to India, and to find their destined port there after crossing more than a thousand miles of open ocean; but, also, that in later times the East and West Indies were explored and colonised and laid down on maps, without much error, long before chronometers or sextants were known. It is also matter of fact that the common way of finding a distant island was the simple one of running along the latitude till it came in sight, for at least two centuries after the discovery of America. The use of longitude, except in the roughest form, is a very recent refinement in the art of navigation. Easter Island lies far out of any ordinary course to vessels coming round Cape Horn, and could not easily be found by them without accurate observations of longitude; but it lies a little south of the tropic, directly in the track between the Chilian coast and the chief groups of Polynesia, and any vessel from that coast, holding to this latitude within one or two degrees, could scarcely miss it in fine weather, if it went far enough, for the island is visible at a distance of forty or fifty miles.

But a good knowledge of the effect of change of latitude on the appearance of the heavenly bodies would naturally arise among men of ordinary observation accustomed to use a high road 1,500 miles long and running north and south. That road alone is sufficient to make the study of astronomy one of the probable facts in the history of the people, and it is well known that at the time of the Spanish conquest the

native kingdoms still showed some acquaintance with the subject.

It is worth noticing that our own astronomy came from the Nile and the Euphrates, each of them a great highway of traffic running through nearly ten degrees of latitude, in a climate where the skies are generally clear.

There is, therefore, no real improbability in the supposition that the Pacific, in its tropical parts, has been successfully navigated in former times from the American coast.* The chief necessity would be a strong spirit of daring adventure, afraid of nothing and not easily baffled by difficulties, and this is precisely the character indicated both by the works in Easter Island and by those of ancient Peru.

A tiny spot like this could not, indeed, be itself the goal of naval expeditions, but the numerous and important groups lying far beyond it would, if once discovered, be sufficiently attractive, and Easter Island might prove a convenient place of call in the long voyage. It might often be missed, and might be visited only at long intervals, but the help which the case requires is not frequent help. It is the proper tools and the skill to use them, and the means thus given both of supporting a larger population and greatly increasing their powers, that must be supplied. The island also would have the double chance of visits from vessels both going and returning, and if the tradition that the inhabitants came originally from a distant island to the west had any foundation in fact, it would easily arise in this way. The tradition itself, however, is worthless in this case, as I pointed out in my former paper. It may be true, but there are no real grounds for believing it.

* That the Pacific Islands were probably colonised from America was suggested as early as 1808, by a Spaniard, De Zuniga, in a history of the Philippine Islands, published at Manila. The same view was also adopted by Ellis, the author of *Polynesian Researches*, who afterwards abandoned the idea of an American in favour of a Malay colonisation; a view no longer tenable, however.

We have no means of setting a limit to the degree of maritime knowledge possessed by unknown nations in the past. The true history of the compass even we are absolutely ignorant of. The essential part of the instrument could only be discovered by accident, and has probably been so discovered many times and in many places, and the question when and where and to what extent the discovery would be turned to any practical use is altogether dependent on local circumstances.

People who travelled only by beaten routes on land would see no use in it, while any sea-going race, who felt the want of guidance in cloudy weather, might seize on its practical application if the polarity of the magnet ever chanced to be observed. It is impossible to say that this has only been done in the old world, or that the discovery once made could not be forgotten by a declining race when naval enterprise disappeared. Where are now the fleets of Phœnicia or the people who manned them?

Nor can any conclusion be founded on the fact that, as far as we know, American sailors never reached the old world in historic times.

Besides the reservation that this is only "as far as we know" in a matter where there is very little knowledge indeed before the Christian era, there is the plain fact that European or Asiatic sailors knew nothing of America during the same period. If the sailors of the old world were deterred by the want of a sufficient object in braving the dangers of an ocean whose extent was unknown, those of tropical America might be kept by similar reasons from going round Cape Horn or crossing the Atlantic.

The views laid before you are only guesses at truth in a matter where we do not possess positive knowledge. But what is the alternative if we reject them? Nearly all the Pacific Islands were peopled by some means or other.

What are the proposed means on any other hypothesis? The difficulty of the case is so great that the idea of a submerged continent, of which the present islands are the mountain tops and their inhabitants the descendants of its former people, is still at times resorted to. But the mere length of time involved is conclusive against this view. A subsidence of at least 1,000 fathoms since the submergence was complete is necessary, and geology will certainly not admit the reasonable probability of such an occurrence in less than as many centuries. But this gives 100,000 years of separation, and it is incredible that savage races, detached from each other for even a tenth of that period, should retain such resemblances in their languages, to speak of nothing else, as actually exist. The proof of real association among the ancestors of the native races, within a period at least comparable with that of historic times, must be considered complete. Dismissing this hypothesis, therefore, it follows that the present races have been carried to the islands across the sea. This could be done only by intentional voyages which presuppose the power of navigating the ocean; or else by the accidental drifting of canoes or rafts, with human beings on them, from the continents or from islands near enough to be accessible to continental nations who could not navigate the ocean.

The latter is still the common theory among modern anthropologists. In my former paper I pointed out briefly the want of any rational basis for it, and no attempt that I am aware of has ever been made to meet the objections to it. But the theory holds its ground, and it is necessary to examine it afresh, although in doing so I shall have, in some degree, to repeat what I have said before. It is, in fact, about as reasonable to explain the peopling of the Pacific Islands in this way as it would be to attribute the native fauna of England, past and present, solely to the accidental arrival of continental animals on driftwood across the channel.

Accidents of the kind supposed do really happen in both cases, but in both cases they are infinitely too rare to account for the phenomena.

The islands of the Pacific laid down on an ordinary map, number several hundreds. There are at least twenty principal groups separated widely from each other. Few of the islands are larger than the Isle of Man, and they spread over an ocean space at least 5,000 miles across in every direction. With very few exceptions, every island capable of supporting a few hundred people has been found inhabited.

Now, a theory is of no use unless its practical working will bear examination. If accident is to be accepted as the cause of this human distribution, we must be able to trace in a general way the method by which it could produce the result.

Human beings, in a savage state, wander indefinitely as far as there is land to tread on. When they find themselves settled on the sea shore they generally make boats of some kind, to fish in, or to cross from headland to headland, and these boats occasionally are carried out to sea and never return. Generally in such cases the people perish, either from hunger and exposure, or from the upsetting of the vessel, but sometimes such a boat is carried to some other shore with its crew still alive, and sometimes they are able to land in safety. If this occurs; if the people thus landed are of both sexes and the proper age; if they escape the various dangers of the first few years, and if children are born and grow up to manhood, then the crew of the stranded boat may become the ancestors of a family and a race in the land they have drifted to. But failure in any one of these conditions makes it wholly impossible. The boat when it starts must contain men and young women. They must have provisions on board enough to keep them alive during their involuntary and unexpected voyage; they must be carried to land before

they perish; both men and women must land safely; both must survive in their new home; neither want of food, disease, nor quarrels among themselves must interfere with their survival, and children of both sexes must be born and brought up.

It needs only to enumerate these conditions to see how rarely it is possible that all should be fulfilled together; and great as are the chances against each of them, even separately, the fundamental condition, the safe arrival of a living crew on any shore whatever, is in the case before us the most improbable of all. For they must be driven by mere accident, not upon a long continental coast, to be reached sooner or later if they keep long enough afloat, but upon some small speck of land rising in mid-ocean, which a whole fleet of castaway boats will be driven past for any one that touches it. Moreover, nearly all the Pacific islands are within the tropics, where the trade-winds blow very regularly from the eastern side of the ocean towards the west, so that winds in the opposite direction are nowhere the prevailing ones. In like manner the general currents are from east to west, except in a narrow belt a little north of the equator. The general course for stray canoes, therefore, is not easterly, but westerly, and all the meagre chances on which this drifting theory depends are again reduced enormously by these facts alone.

If everything happens, nevertheless, that is needed for the purpose; if ten men and ten women, for example, are cast together in good health on a fertile island, their number may, under favourable circumstances, double itself about three times in a century, so that possibly there may be nearly two hundred of this tribe in one hundred years; half of these, of course, being children. How long would it take to people the whole Pacific by such a process, remembering that this imaginary drifting, from whatever place it started, must be first to the

nearer islands, the only ones that could by any chance be reached alive, and then gradually by hundreds of repeated accidents from these to others, and so on through the whole? And what was the final accident that brought the ancestors of a vigorous race to Easter Island, carrying them alive and well, necessarily across some fifteen hundred miles of uninterrupted ocean, and throwing them straight upon a coast nine miles long, with several thousand miles of open water on each side of it?

The truth is, that no more baseless supposition than this of the general peopling of oceanic islands by mere accident has ever been accepted as a scientific theory, and it has only been accepted because the details of its practical results have not been considered with sufficient care. The time will assuredly come when the existence of human beings in these isolated spots will be felt to prove a former power of navigating the sea, as much as the presence of the larger continental animals on neighbouring islands proves a former connection with the land. In both cases the limits of what mere accident may do can be reasonably estimated, and the whole body of facts cannot be accounted for by any such means.

Concerning these imaginary accidents, I have myself made no little search for any trustworthy account of cases in which a drifting canoe is known to have arrived at any distant island with such a living crew of savages as might have founded a colony there, but I have never met with such a record. I cannot say that no such account exists, but the extreme rarity of the event, which is as likely to have occurred during the last hundred years as at any former time, is manifest. Captain Cook relates one of the nearest approaches to it, as he had the facts from the survivors, in 1777. In this case a canoe containing twenty persons of both sexes was really driven by storms a distance of 600 miles in the Pacific, and then thrown upon a small island.

But only four out of the twenty remained alive. They were all men, and they were only saved at last by the help of people already living in the island. There could be no more striking commentary on the theory of accidents, and the drifting in this case was, as might be expected, from east to west.*

Captain Beechey gives another remarkable case, which he also heard of from a survivor. In the early part of this century twenty-three men, with their wives and children, started in a large double canoe from Chain Island, in the Low Archipelago, intending to sail to Tahiti, about 800 miles west, and with provisions for the voyage. Their purpose was defeated, and they were kept many weeks on the open ocean by successive storms and calms. Many of them died, but the rest were ultimately carried to another island, this time in a south-easterly direction, where they landed by their own exertions. But the people here were not really in the condition of savages. This group of islands had been under more or less European influence for a considerable time. Missionaries were settled there. The voyagers themselves are said to have

* Captain Cook's remarks upon this particular voyage appear, however, to be the original source of the theory to which, in fact, it is so distinctly opposed. The island referred to is Wateoo, where some of Cook's officers landed, and where they met the men who had been saved. He wrote as follows:—

“The landing of our gentlemen on this island, though they failed in the object of it, cannot but be considered as a very fortunate circumstance. It has proved, as we have seen, the means of bringing to our knowledge a matter of fact, not only very curious but very instructive. The application of the above narrative is obvious. It will serve to explain better than a thousand conjectures of speculative reasoners, how the detached parts of the earth, and, in particular, how the islands of the South Sea, may have been first peopled; especially those that lie remote from any inhabited continent, or from each other.”—Cook, *Third Voyage*, book 2, chap. 2.

Nothing, of course, could be more natural than that such an idea should suggest itself at first, and Cook had neither the time to examine it thoroughly, nor the necessary information. He heard the narrative and wrote his account during the voyage in which he lost his life.

been Christians. They had necessarily acquired knowledge not attainable without civilised intercourse, and they finally owed their lives to the fact that they had an iron hook on board, with which they succeeded in catching a shark when their food was gone and they had begun the dreadful process of eating one another.

The late Dr. Laing and the Rev. Mr. Gill have given reports of several canoe voyages of a similar kind, one or two being within their own knowledge; but these are again from east to west, as they must necessarily be in most-cases, and there is not one of them in which it is quite clear that the required conditions were fulfilled.

And I have spoken of this theory hitherto as if these islands had only been peopled once, by the races which have since then inhabited them. But what if they have been peopled more than once? The whole series of fortunate accidents must then have been repeated as many times as this has occurred! There are strong grounds for thinking that several distinct races have been spread over the Pacific, and that each of them found inhabitants already on the islands when they came there. I need not enter into this question in support of my own views, but I would refer those interested in it to Mr. Fornander's "Account of the Polynesian Race, 1878," and to recent papers in "Nature," by Mr. A. H. Keane.

I will, however, mention one remarkable example of a lost history, probably as strange as that of Easter Island, seven thousand miles away from it, at the other extremity of the Pacific groups. Near the eastern end of the Caroline Archipelago, which consists chiefly of small coral islands scattered over two thousand miles of ocean, north of the equator and far to the east of the Philippines, there are a few volcanic islands, the largest of which is Ponopé. This is about twenty miles long, and rises two thousand eight

hundred feet above the sea, resembling, therefore, the Island of Arran in size and elevation. There are cliffs of basalt a thousand feet high, and, on the east side, a small detached islet, with some extraordinary buildings upon it. These have been examined and described in detail by Mr. Kubary, naturalist for the "Muséum Godeffroy." The account is in the "Journal des Muséum Godeffroy" for 1874.

The buildings cover about a hundred acres, and consist chiefly of square or oblong stone platforms of various sizes, separated by canals, from 10 to 80 yards wide. These platforms have been raised upon the shore of the islet, where they stand nearly dry at low water, the flood tide, however, filling the canals between them, and converting them into little islands. They are six or eight feet high, which is rather more than the rise of the tide. The builders constructed walls of basaltic blocks to inclose the required space, and then filled the interior with blocks of coral from the neighbouring reefs, paving the top finally with basalt. There are about eighty platforms, most of them with no superstructure now remaining; but on several there are considerable buildings. The most remarkable are on a platform about 80 yards long by 70 wide. On this is erected a structure 72 yards long by 60 wide, the outer wall of it being 25 to 30 feet high, and 10 feet thick. There is an entrance 14 feet broad, and a second smaller quadrangle, with walls 15 feet high, is found inside. There are also dividing walls and raised terraces within these inclosures. The walls are built of columnar basalt, in long blocks laid crosswise, so that the ends of alternate layers of the columns appear in the faces of the walls, and their length determines its thickness. The walls seem to be widest at the bottom, shorter columns being used in the upper parts, but the smallest blocks at the top weigh over a hundredweight, and many of the lower ones over two tons. The whole weight of the stone work in this

single platform would not be less than 30,000 tons. A considerable portion has been raised from 20 to 30 feet, and the whole of it brought from some distance. These buildings and platforms are known as the ruins of Nanmatal. The mode of construction is quite peculiar. The date and purpose are entirely unknown. Graves are found on some of the platforms, with human remains, rude ornaments, and stone axes, but whether they are of the same age is not clear.

On the sea side of the ruins there is a wall, 10 yards high and 10 yards thick. The canals are well adapted to receive canoes or other vessels at high water, the platforms making continuous quays. The ruins are overgrown with vegetation. A bread-fruit tree, three feet in diameter, was found growing on one of the graves. The natives consider these buildings to be the work of spirits. The island is 1,000 miles from New Guinea, and 2,000 miles from the Philippines or from Japan. To suppose that savages living on it without external assistance were the builders would be again to make our judgment subservient to our prejudices. The works described are, in fact, what modern engineers would be likely to construct, if such structures were wanted, and they were thrown upon their own resources, in an island of this kind.

In all scientific inquiry our theories must necessarily be in advance of our knowledge, for we cannot help seeing the things that are probable beyond the things that are sure; and science would be an uninviting pursuit if it were otherwise. But the truest scientific spirit is that which is most careful to distinguish between knowledge and hypothesis, and most anxious to give their full weight to any facts at variance with our opinions. Our real knowledge of the history of human life in this world, where written records do not assist us, is at present so extremely small, that scarcely anything concerning it ought to be treated as established truth, no longer to be questioned.

The opinion that the savage races now existing are direct descendants from ancestors more savage than themselves; admits of no proof, and has no claim to be treated as more than a conjecture: it assumes what no theory of evolution can render probable in itself. Those who believe as the result of other theories, that the remote ancestors of men were animals of another kind, are naturally anxious to find some visible evidence in favour of this view, and they have seized upon the difference between savage and civilised races as illustrating the latest steps in the evolution of the human species. But the difference is not a specific one. It does not consist in the presence or the absence of any known physical characters. It is not the increase or decrease of any special organ, or the change of one organ into another. The difference is really the practical result of four causes, always acting where human beings exist, and always determining their general condition. They are, the Balance of mental tendencies; the Degree of mental energy; the extent of acquired knowledge, and the opportunity of turning it to practical account. If differences in the first two of these depend upon a difference in physical structure, its true nature has not yet been discovered. That mental tendencies and mental energies are very generally inherited there is no doubt, but it is equally certain that they are altered in the lifetime of individuals to an extent and in a manner which have nothing in common with the process of physical evolution.

Whatever the real origin of mankind may have been, it is separated from ourselves by so great an interval; there have been in the world men and women with natures substantially like our own for so many hundred centuries, at least, that to suppose that we can find now, anywhere, any tribe or family which has only gone through successive stages of development, neither falling back, nor being carried artificially forward by intercourse with races higher than

itself, is scarcely rational. Progress or its opposite among human beings are so completely dependent upon surrounding circumstances, and these vary so continually from so great a number of causes, that constant progress for an indefinite time in any particular race in any locality can never be expected. The natural course of events is that each tribe or nation should advance while the conditions are favourable, and retrograde when they cease to be so, and that after the lapse of so many ages the state of any race now existing should be the result of many changes of both kinds through which the line of its ancestors has passed. But degradation produces a new condition of life; it does not reproduce an old one; and, among rational beings, intercourse with a higher race causes rapid changes which are not those of spontaneous development. That the continent of Asia on one side, and that of America on the other, should have been the seats of some kind of civilisation, we know not for how long in the far distant past, and that the islands between them should be peopled by uncivilised races, coming necessarily from these continents at first, in that, or in a lower, condition, and never being interfered with afterwards, but slowly developing among themselves the slowly ascending stages of savage life, is a view which is improbable at first sight, and which becomes incredible on reflection. Yet this is what is really assumed when the Pacific Islanders or any existing savages are spoken of as representing an early stage in the development of mankind. If they are the degraded descendants of more civilised races, their present condition is a later stage than that of civilisation. It is later, of course, than that of their ancestors, whatever that may have been. If their ancestors were in a higher condition, the question how they came to be so, and what was the condition preceding this, becomes the question for our inquiry, but at present it cannot be answered. Every civilised race whose ancestors

are known to have been in a state of barbarism, and whose course of progress is also known, has become civilised by contact with another race already in that condition. There is no exception to this anywhere, as far as our knowledge extends. If that has always been the case; and we have no right to assume the contrary until it is proved; the problem is insoluble on the theory that at some former period all men were savages.

The phrase "Primitive Man," which we hear so frequently, involves an assumption unwarranted in itself, and the constant source of error in reasoning. It assumes that we have some knowledge of a period when all mankind were pretty nearly alike. The assumption is opposed to experience, and unsupported by any evidence, and it has been taken for granted, as such things often are, because it accords with some preconceived ideas, while the direct objections to it are not obvious at first sight.

But human beings, as we know them, are beings who, while they are alike in the general attributes of humanity, differ widely among themselves in the mental qualities which determine their mode of life and their relation to each other. These qualities, being inherited, every circumstance which separates a family, a tribe, or a nation, from the rest of the world, gives it in consequence, in a few generations, a special character of its own. By what means does our knowledge stretch backward to any period when it could be otherwise? And while men have been distributed over the greater part of the earth, how is it possible that any general name for their condition could properly apply to all? No such name is applicable now, nor has been in any recorded period. If we could trace ourselves to a time when the whole human race consisted of a single small tribe living together in the same district, such a tribe might indeed be called "Primitive Man," with something like scientific accuracy, and if we

knew the physical and mental characteristics of these people, we could say how far they resembled or differed from ourselves.

But the name would lose its meaning as soon as human beings were spread over the world. They were so already, at the earliest dawn of our present information about them, and the one thing certain is, not that they could then be all alike, but that, if human at all, they would necessarily differ, the extent of their differences being absolutely indeterminable by any *à priori* reasoning. In default of evidence we are simply ignorant on the subject, and must wait for knowledge before any assertion can be justified. No discovery of rude implements in very ancient periods can affect the question, because the existence of human life in its lowest form can never prove that higher races were not living at the same time. They co-exist at present. They have done so through the whole historical period, and nothing yet has been discovered to throw any light upon the inquiry how far back this was still the case.

The lowest and the highest types of human nature co-exist, indeed, not only in separated communities, but even now amongst ourselves. Every civilised nation contains a large number of individuals who, if they could be separated from the rest, would become actual savages in a very short time. The distinctive mark of savage life is the absence of any effort to obtain more than bare necessities and rude enjoyments by the easiest means. It is the desire for more than this, accompanied by sufficient intellect to see how it can be got, and sufficient mental energy to undergo the needful labour, that creates civilisation. These are mental characteristics. They are not possessed by nearly all the inhabitants of even the most civilised state. In large civilised communities, most men have had four distinct lines of ancestry in their four grandparents, and the mixture of families is so rapid that almost everyone has had, within a few generations, at least

one ancestor of the highest type ; so that an average standard is kept up, and even the best qualities and powers may reappear in the most degraded homes. But you have only to provide the means by which these products of degradation may be separated from the rest ; by which the number of children born with the finest mental qualities will therefore be greatly reduced ; and by which the occasional bursts of individual excellence that would at first arise among them may be repressed when they appear, and savage life will soon be the inevitable result. Such means may be supplied by national decay, under circumstances leading to national isolation, and though the present state of general progress may go on uninterruptedly till there are no savage races left in the world, they may be produced at any future time by the recurrence of their natural causes, through moral changes or through the physical ones accompanying another glacial period, or a new distribution of land and sea. What is thus possible in the future becomes more than probable in the past. We know that savage life has repeatedly followed a higher condition in many parts of the world, and we see here its efficient cause.

These views, remember, involve no assertion as to the intrinsic capabilities of human nature in each individual. They relate only to practical results under the conditions of life in this world. Every individual may have that within him which makes unlimited progress possible to him ; and let me add, that this is my own firm belief. But in the short life of this world, the time and opportunity for individual progress are measurable quantities ; the adverse influences are always present, and we learn the result by experience alone.

In the anthropology of the future, when some crude ideas have been abandoned and some prejudices overcome, the importance of Easter Island as a special starting point for

inquiries of the highest value will no doubt be recognised. The indifference with which it has hitherto been treated is indeed remarkable; for though no other spot in the world is like it, either in the nature of its antiquities or the singularity of its position, no careful examination of the island for scientific purposes has yet been made. The few visits of competent observers have been merely hurried calls, and the Frenchman, Bornier, who died there in 1876, after having been more or less in possession of the island for several years, burnt his papers, whatever they may have been, before his death, according to Pinart's information. The "Challenger" visited Tahiti and Juan Fernandez, but left Easter Island untouched. It is supposed to be at present nearly uninhabited. M. Pinart states that only a hundred and eleven human beings were left there in the Spring of 1877.

NOTE.

In the old Egyptian quarries at Syene there is an unfinished obelisk, from forty to fifty feet in length, never completely separated from the rock, where the method of detachment is plainly visible. I have been furnished with the following account of it by a recent eye-witness. The cutting is horizontal:—

"The front and upper faces of the obelisk had been dressed *in situ*; at the back a deep groove had been cut, and to meet this groove many pairs of holes had been drilled beneath and parallel with the fourth face. These drill holes had been connected in pairs. Into each opening thus formed wedges of wood have been driven, and these still exist. With the assistance of a surface notch from opening to opening the rock is thus cracked, and the obelisk raised from its bed; but in the case in point, either from unequal driving of the wedges, or from a flaw, the obelisk has cracked across near its base. This crack probably led to the abandonment of the intended monolith."

The method of detachment here described is substantially that which M. Pinart attributes to the Easter Islanders, but with the practical details filled in. But it was the method chosen, not by a small savage tribe, but by a highly civilised, numerous and powerful nation, who worked with metal tools, and had the experience of ages in the art of sculpture on the largest scale; nor does it differ much from what is done in our own quarries. I imagine this to be the obelisk referred to in Wilkinson's "Ancient Egyptians," chapter 9.

THE DIMENSIONS OF THE STELLAR UNIVERSE.

By R. C. JOHNSON, F.R.A.S.

To an observer of the heavens with the naked eye on a clear moonless night, at any particular spot on the earth's surface, the number of stars visible does not exceed 2,000 ; the whole number which is visible in this latitude is about 5,000 ; and the total number visible in the whole of the heavens is only between 7,000 and 8,000. The grand total which can be seen in the most powerful telescopes does not probably fall short of from 70 *millions* to 80 *millions*.*

Out of this enormous multitude the distances from the earth of only about twenty-five are known. Yet from this knowledge are deduced all our ideas of the dimensions of the stellar heavens, of the magnitude of the stars or suns, as they really are, of which it is composed, of their intrinsic splendour, and of their velocities ; in fact, almost all our conceptions of the universe, external to our system, are founded upon a knowledge of the distances of these few stars. For our acquaintance with the shape and extent of the galactic zone, of the connection with it of the stars, clusters and nebulæ, and of those wondrous congeries which contain all

* In respect to the rendering of stars visible, or space-penetrating power, a telescope is merely an enlarged eye, in which the power varies in proportion as the area of the object-glass or mirror exceeds that of the pupil of the eye, an allowance being made for the absorption of light occasioned by transmission through the thickness of the glass of a refracting telescope, or in want of polish in a reflector. This is so because the highest magnifying power will not exhibit a perceptible disc on any star.

these objects mixed together, the Magellanic clouds, depends upon the solution of the problem of stellar distance.

We propose to explain something of the difficulties which caused all attempts prior to the invention of the telescope to ascertain the distances of the stars to be hopeless failures; then to describe what is known of those stars which have been measured; and, finally, to show how from this knowledge is gradually being evolved a scheme that may possibly comprehend the physical connection of remoter stars and systems.

To a cursory observer, who has watched the heavens for twenty or thirty years without perceiving any change, it might appear an easy thing to measure exactly the relative positions of the stars, and by a comparison of these measures to deduce evidence of a change of distance or position; but when the attempt is made there are found to be many disturbing influences, which render the task one of the utmost difficulty.

The position of the astronomer is something like that of a fly floating on a chip on the surface of a gurgling torrent, sometimes jumping up and down on broken waves, and anon whirled about amidst the gyrating eddies.

If his movements are more amenable to law, they are not the less complex, as a moment's consideration will show; for, assume a standpoint at the earth's equator, he firstly is rotated once in a day at the rate of 1,500 feet per second; secondly, he is carried on the course which the earth describes in its annual journey round the sun at the rate of about eighteen miles per second; and, finally, he is taking part in the joint motion of the sun and all the planets in the direction of the constellation Hercules, at the rate of about twenty-six miles per second.

The interval which separates the solar system from the nearest star is so vast, that the earth's diurnal rotation on

its axis, causing an apparent displacement of all celestial objects which is called geocentric parallax, makes no appreciable difference in any measures (and may therefore be eliminated); and we shall find that the nicest measurement is requisite to render either of the other movements perceptible.

The distance of the moon, the nearest celestial body to the earth, is calculated by observing its displacement among the stars (which for this purpose may be conceived to be infinitely distant), when viewed from two positions on the earth's surface, as far as possible from each other. If observations could be made from points at the extremities of a diameter of the earth, there would then only be available a base line of about 8,000 miles, with which to measure an object at a distance of 240,000 miles; so that a triangle is formed, having the proportion of base to altitude as 1 is to 30, such as a surveyor would term an ill-conditioned triangle.

It is obvious, then, how inadequate a base the earth affords for ascertaining the sun's distance of 93,000,000 of miles. In fact, the problem could never have been solved by the direct method, because, in addition to this difficulty, owing to the sun's brilliancy, it is impossible to observe him, and a star in his vicinity at the same time. It was not until Kepler proved the relation between the periods of the planets and their distances that an observation of the displacement of the planet Mars among the stars afforded the first accurate determination of the distance of the sun from the earth.

As soon as the distance of the sun was known with the accuracy which this last method of observation afforded, it was at once seen to be possible to use this distance itself as a grand base line of 186,000,000 miles from which to attack anew the problem of stellar parallax.

And great, at first, must have been the disappointment

experienced when it was found that even with so extended a base the problem was almost insoluble, for, as we shall see further on, the change in the position of the nearest star, which is caused by its being viewed from the opposite sides of the earth's orbit at intervals of six months, is only about one-tenth part of that by which the sun would be displaced if viewed from stations separated by the amount of the diameter of the earth, or is less than one second of arc. This involves the accurate measure of a movement (which takes place, not on the same night, but requires an interval of six months for its accomplishment) over a space in the sky of only one two-thousandth part of the apparent diameter of the moon.

Ancient astronomers argued, and very justly too, from a logical point of view (their limited knowledge being taken into consideration), that if the earth revolved in an orbit round the sun, the fact would be manifested in an annual change of position of the stars. Their logic was correct, but one of their premises was wrong, and therefore their conclusion that the sun revolved round the earth was also erroneous.

It was not until long after the invention of the telescope that the huge magnifying power which it placed at the command of the astronomer was rendered useful for micrometric measurement by the further discovery of the value of a hair, or fine line, as a fiducial reference when placed in the common foci of the object-glass and eye-piece. By this latter discovery the important work of celestial measurement was quite as much facilitated as that of physical discovery had been advanced by the former one.

The solution of the direct problem of stellar parallax is one of great difficulty, not only because the quantity sought is a very small one, but also because it has to be extricated from a number of interfering motions, each of which is generally of much greater magnitude than itself.

The history of research for the parallax of the stars is a history of unlooked-for discovery in other directions.

The attraction of the sun and moon upon the redundant matter accumulated round the terrestrial equator gives rise to the precession of the equinoxes, an effect which displaces the pole of the equator $50''$ in every year, and consequently by the same amount alters the apparent places of the stars. Precession was discovered by Hipparchus about 125 B.C. The perception of so small a movement is an everlasting tribute to the merit of early astronomers. Copernicus first gave the true explanation of it, and Newton first showed its physical cause.

In searching for evidences of stellar parallax, Bradley, between the years 1727-45, discovered that, mixed up with the precessional movement of the stars, there was another smaller inequality of $18''$, to which the name of nutation has been given, which required a period of nineteen years for its accomplishment.

Before this, however, the same distinguished man, who occupied the post of third Astronomer Royal of England, had in the year 1727 discovered the aberration of light, also while engaged in the attempt to ascertain the amount of stellar parallax.

The aberration of light is a consequence resulting from the fact, that while the earth moves at the rate of nineteen miles per second in its orbit, and light travels at the rate of about 186,000 miles per second, yet as this great velocity is not infinitely greater than that of the earth's orbital velocity, but greater only in the ratio of 186,000 to 19, it follows that all celestial objects will appear to be displaced from their actual positions by about $20''$. Bradley came rightly to the conclusion that the parallax of γ Draconis, by observations of which he discovered aberration, did not exceed $1''$.

About the year 1790 Sir W. Herschel attempted to

discover stellar parallax by a direct method, a method in which none of these inequalities affect the result. He supposed (as did Galileo before him) that when a bright star appeared to be in juxtaposition to a very faint one, it was by reason of their difference in distance that they varied in brightness, so he set to work to measure the positions of a number of such stars. But here again was disappointment; motion there was, but not of the looked-for sort, and so, instead of finding out the distances of the stars, he made the immortal discovery of binary systems, bound to each other by the universal law of gravitation—the grandest generalisation of his age!

Thus we find that, in the attempt to solve the problem of stellar parallax, three important discoveries were made; the nutation of the earth's axis, the aberration of light, and the extension of the law of gravitation to the universe.

It was not till so recently as 1840 that the actual proof of stellar parallax was made by Bessel, who, after three years' rigorous observations of 61 Cygni, showed that it had a parallax motion of $0.3''$.

This discovery was full of significance, for all attempts had previously been made on bright stars, on the assumption that probably their magnitudes would be in the inverse ratio of their distances; yet the first star which was found to have any assignable parallax was not of the first magnitude, but an insignificant one of only the sixth. This star is still the nearest known star in the northern hemisphere.

At almost the same time Henderson, who was observing at the Cape of Good Hope, announced that the parallax of α Centauri amounted to $1.0''$. So that the two nearest known stars were discovered within a short interval of time, and although immense labour has been devoted to the research, no other stars so near as these have yet been found. How frequently it has happened in the history of science that

valuable discoveries have been made by more than one observer at the same time.

The discovery of Neptune, by means of its perturbing effect on the orbit of Uranus, by Adams and Leverrier; of the visibility of the solar prominences in the absence of eclipses, by Jansen and Lockyer; of oxygen gas, by Priestley and Scheele; of the refraction of light, by Gregory and Snell; of the Leyden jar, by Mushenbröck and Kleist; of thallium, by Crookes and Lany; are all instances in point. These show that whenever science is ripe enough for an advance, numbers of indefatigable workers are ready at the right time to extend her domain.

There are now known to be about twenty-five stars in both hemispheres which are affected by parallax. These have been arranged in tabular form for convenience of comparison. The first column of the Table contains the stars' names or numbers, and is in order of their respective distances; the second column gives their magnitudes; the third contains the expression of their distances in terms of the apparent size of a spherical body which would fill up twice the distance between the sun and the earth;* the fourth column is the distance denoted by the third, expressed in the earth's distances from the sun, or is equivalent to about 93 millions of miles, multiplied by the numbers given in the column. If the distance from the earth to the moon be represented by 1 inch, the distance to the sun would be $10\frac{2}{3}$ yards, to the nearest star, α Centauri, 1,343 miles, and to that of the furthest measured stars about 100,000 miles. The remaining columns will be explained further on.

A glance at the Table will show several remarkable things:—1st. It will be observed that the apparent magni-

* As this enormous globe would not appear at the distance of the nearest star to have any assignable disc, it seems almost hopeless to expect to be able by any direct method to measure the diameter of a star.

tude of a star has no relation to its distance. Certainly the nearest star, α Centauri, is a very bright one, but the following seven in the Table are all faint stars, and four of them are telescopic (*i.e.*, not visible to unaided vision).

Note also that Capella, which is the most distant measured star, is also one of the brightest in the sky, so that between it and α Centauri there is a gap which exceeds the distance of α Centauri from the earth by more than twenty times.

Sirius, the brightest star in the heavens, is only the ninth in order, and it is quite possible, from difficulty of observation, owing to its excessive brilliancy, that its parallax is here over-estimated.

The remaining thirteen stars include six bright ones, and of the rest none are of less than the sixth magnitude, or are just about visible to the naked eye.

It will be observed also that α Centauri is still the only star which is not visible in European and North American observatories which has been found to have parallax. In this fact alone is manifested the extent of an opening for stellar work in the southern hemisphere.

Having arrived at a fair estimate of the distances of these stars, the next question of interest that occurs is, What does this knowledge permit us to predicate of their dimensions and brilliancy?

Many attempts have been made to ascertain the proportion of the light of the stars to that of the sun. The usual method is to compare the stars with the full moon, and that with the sun.

Wollaston, in this way, found that the light received from the sun is to that received from α Centauri as 22,000 millions to 1, but according to the law of the relation of distance to brightness, by which the light received from any source varies inversely as the square of its distance, it follows that

the proportion should be as 48,400 millions to 1 ; therefore he concluded that the intrinsic splendour of α Centauri, as compared with our sun at equal distances, is as 2.2 to 1. According to a rough estimate made by Wollaston, the light emitted by Sirius, the most splendid star in the heavens, is to that of the sun as 1 to 20,000 millions. According to a later and more reliable estimate by Zöllner, it is as 1 to 4,200 millions.*

It follows, from the low estimate just mentioned, that the sun would have to be removed in the latter case 64,807 times his distance to appear as a star shining with the brilliancy of Sirius. But as we see, from the table of distances, Sirius is at least 896,800 times the sun's distance from us, so that, according to the most reliable estimate, Sirius is 13.84 times the distance at which the sun would appear equally bright ; therefore it will, if of the same diameter, have 191.54 times the sun's intrinsic splendour, or, if only of equal surface brightness, must exceed the sun in diameter by 13.84 times.

Let us think for a moment what these figures imply. The sun's diameter is 860,000 miles ; now this multiplied by 13.84 would make a globe of 11,902,400 miles in diameter, or one exceeding the sun in volume by 2650 times.

Although these figures are so enormous, it cannot be said, in the present state of the science, that they are excessive, because at the distance of Sirius it is quite impossible to assign any measurable disc, even to such a vast globe, for 11,900,000 miles at that distance would only subtend an

* One of the chief impediments to progress in this direction is the unreliability of photometry. Estimates by different observers of the relative brightness of the stars, especially of those visible to the naked eye, differ far more than they ought, and the reason is that there is no method of illuminating a surface or of obtaining a point of light which shall at all times be of equal intensity. I think an adaptation of the incandescent carbon light affords the greatest promise of a settlement of this difficult question.

+ Vide *Our Place among Infinities*, by R. A. Proctor, p. 163 *et seq.*

angle of $0''.01$, which is about the one-hundredth part of the smallest disc which is capable of being recognised, as having any dimensions, with the most powerful telescopes. Perhaps these figures convey a better idea of the meaning of stellar distances than the statement of the distances in millions of miles can possibly do.

Let us now apply these facts with the view of deriving from them some information in regard to the size and brilliancy of other stars which have a measurable parallax.

We have just seen by the Table there is no ratio between the magnitudes of the stars and their parallax; in fact, our present knowledge would justify the assertion that the fainter stars are nearer to us than the brightest. But, after all, what can be argued when the distances of only some score of stars out of all the hosts of heaven are even approximately ascertained?

For the sake, however, of showing that there is probably great diversity in size among the stars, we will refer to the last column of the Table, in which is given the diameter of each star, according to its magnitude and distance, on the assumption that they are all suns, shining with the intrinsic brightness of our sun.

In order to show the principle upon which this column is constructed, we will give an example of the method pursued.

It has been assumed that if removed to the distance of α Centauri, the sun would shine as a star of the first magnitude (for we cannot philosophise without assumption in this particular case), and then, by taking the magnitude to be a function of the distance, we have in those cases where the distance is actually known, from it deduced the diameter. One example of the method by which the results shown in this column have been arrived at is subjoined—that of 61 Cygni.

Zöllner proved that the sun must be removed to 236,000

times his present distance in order to shine with the light of Capella (a star of the first magnitude), therefore the brightness of Capella is to that of the sun as 1 is to 236,000³, or as 1 is to 55,696,000,000 ; but the actual distance of Capella is probably not less than 5,000,000 times the sun's distance, or about $23\frac{1}{2}$ times the distance at which the sun would appear of equal brightness ; therefore, on the assumption that the surfaces of both these bodies have the same intrinsic brightness, the diameter of Capella must exceed that of the sun by $23\frac{1}{2}$ times.

It is estimated * that 100 stars of the sixth magnitude are equal in brightness to one of the first, therefore the brightness of 61 Cygni is to that of the sun as 1 is to 5,569,600 millions. But the distance of 61 Cygni is only about 480,000 times that of the sun, and at this distance the sun's light would be 1—230,400 millionth of what it now is, or about 24 times as bright as that emitted by 61 Cygni ; so that, on the assumption of equal intrinsic brightness, we conclude that 61 Cygni is only about a quarter of the diameter of the sun.

From a survey, therefore, of the last column, it will be perceived that many of the stars greatly exceed the sun in diameter : the Pole Star 8 times, Arcturus and Vega 10 times, Sirius nearly 14 times, and Capella no less than 23 times. Now, it must be remembered that their apparent discs will each be represented by the squares of these numbers and their volume by the cubes.

Capella, therefore, will have a disc of 529 times that of the sun, and a volume exceeding his more than 12,160 times. If the density of Capella is equal to that of the sun, this object, which appears as a point of no measurable dimension in the best telescope, must have a mass equal to two quintillions of tons, or 3,777 million times the weight of our earth.

On the other hand, some of these suns are much smaller

* Newcomb's *Popular Astronomy*, p. 411.

than ours:—61 Cygni, as we have just shown, is only one-quarter, and four or five of the smaller stars are actually as in appearance comparatively very small, being only one-tenth the diameter of the sun, and consequently one-hundredth of his apparent disc, and only one-thousandth of his volume, or only three hundred times the weight of the earth, assuming, as before, that they have the same density as the sun.

We have now completed two steps to an acquaintance with the dimensions of the universe by finding out the distances of a few of the stars, and from that have also inferred something as to their brilliancy and dimensions. We will now proceed to a third step, and inquire what is known of the direction and velocity of their movements in space.

Besides the movements due to the causes which we have just enumerated, there is a residual motion, which, because of its irregularity, is called a star's own, or proper motion.

Bradley showed, in 1748, that this motion might be caused either by that of the sun in space, or by an actual movement of the stars themselves, and the motion proved to be compounded of these two; most of the stars in the heavens being affected by the sun's movement among them, while only a few as yet are known to have a certain movement of their own. In the *latter case, only is the strict sense* of the term employed, because in the former the motion is really only an apparent one. From a consideration of the apparent proper motion of the stars, it is possible to ascertain the direction in space in which the solar system is moving. This is done by observing in what part of the heavens the stars appear to be opening out, for the point where this takes place to the greatest extent is the part towards which the sun is travelling. This can also be confirmed by observing the converse effect or the closing up of the stars at the opposite point of the heavens from which

the sun is receding, and it can be further proved by there being the greatest amount of motion in a belt of stars at right-angles to this direction. All these effects have been observed, and the result is that the sun and planets are moving together towards a point in the constellation Hercules, situated in R.A. $259^{\circ} 51'$, and in N.D. $33^{\circ} 39'$.

M. Otto Struve, taking from a large number of observations as his basis the average parallax of stars of the first magnitude at $0''.209$, found that the annual proper motion of the sun would be $0''.339$, or that his actual annual motion would be equal to 1.623 radii of the earth's orbit, or about 147 millions of miles.

We see, therefore, that this movement, like that caused by annual parallax, is extremely minute. On the determination of the amount of the motion of the stars as the sun passes among them, our ideas of the dimensions and form of the stellar system with which our sun is connected are being gradually evolved; and on the determination of their independent movements will depend the future of our knowledge of the laws which control the movements of the universe.

With regard to the motion of the sun among the stars, several questions which cannot yet be answered occur.

Does the sun move in a straight line? To this it seems easy to answer from analogy, No! Then, is the curve a circle or an ellipse, so that, after the lapse of countless ages, he will return again to the same point in his orbit? Or, is it a parabola or hyperbola, or some curve of unknown dimension; or is there no controlling centre?

When the apparent proper motion caused by the sun's movement in space is eliminated, there remains a residual movement of certain stars, occasioned by their actual motion in space, and this it is only, as we have said before, which is rightly termed proper motion.

There are only a very few stars (see Table, column 5) whose proper motion has been ascertained, and it is in all cases a minute quantity. There are not more than eight or ten in number in which it exceeds 8" per annum, and it is a curious fact that there are only six of these to be found among those twenty-five stars whose parallax is known.

The value of the proper motion of a star cannot, of course, be found unless its distance is known. We will take the cases of three of the stars referred to in order to show what is known of their actual motion, and you will see that a simple arithmetical operation gives the required information; for we have only to divide the amount of the annual proper motion by that of the annual parallax, and multiply the quotient by the radius of the earth's orbit, to obtain the actual annual motion of any of these stars in a direction at right-angles to our line of vision. The result in the case of 61 Cygni is—

$$93,000,000 \times \frac{5''.2}{0''.49} = 1,125,000,000.$$

In the case of 1,880 Groombridge, the result is something startling. This star has the largest known proper motion, while its parallax is less than one-tenth of a second of arc, so that the result is—

$$93,000,000 \times \frac{7''.0}{0''.09} = 7,233,000,000.$$

So that this star has an annual motion of 7,233 millions of miles, which is considerably over 200 miles in every second of time. The dynamical results of such a velocity are remarkable; it seems almost impossible that such rapid movement can be under the control of a central body.*

These velocities are still more extraordinary when it is remembered that they are due to a motion at right-angles

* For further speculation on this subject see Newcomb's *Popular Astronomy*, p. 485.

to our line of vision, and they are therefore the least possible rates of speed which the stars in question can have ; and as the direction of their motion may be considerably inclined to the axis of vision, their velocities may greatly exceed those which have been stated.

Spectrum analysis has within the last few years furnished a new means of detecting motion. By the observation of a slight displacement of the absorption lines of a spectrum, it is possible to assert the existence of motion either of advance or recession directly in the line of sight.

This motion is called radial motion, and is at right angles to the proper motion just described.

We cannot here enter upon a detailed account of the theory of this beautiful discovery, but it can be rendered intelligible by a short comparison with a very similar effect well known in the domain of acoustics.

Every one has noticed when travelling at a high speed on the railway, how the whistle of an approaching train is much shriller than usual ; for a moment as the two trains meet, the sound is at its normal pitch, and as the trains leave each other the tone is distinctly lowered. The reason of all this is that as the trains are rapidly approaching, the sound waves are heaped together or shortened, and therefore the sound heard corresponds to that emitted by shorter undulations, and *vice versa*, as the trains recede from each other the sound waves are lengthened out, and the sound heard corresponds to that emitted by longer undulations.

Now, let this be applied to light, in which colour is equivalent to pitch in sound.

If, then, a luminous body approaches the spectator rapidly, by the shortening or crowding together of the undulations, the light should be rendered more violet (the colour due to short vibrations), and in the opposite case more red (the colour due to long vibrations). This is an extreme sup-

position, in fact, a *reductio ad absurdum*, for it is not possible to conceive of a body in motion so rapid that the colour of its light could be thereby affected. Yet spectrum analysis furnishes a view of the light of a luminous source, on a scale so enlarged that the ray passing through a slit the one-hundredth of an inch in aperture, may be spread out to the extent of several feet; and as in the dispersion spectrum there are numbers of lines of extreme tenuity whose wave-lengths are accurately known, it is possible, by observing a slight displacement of the lines of light emitted by certain stars, when compared directly with the same lines in terrestrial spectra, to perceive a displacement on one side or the other, which can be due to no other cause than approach or recession of the star, through the crowding together or lengthening out of the waves of light.

The amount of this displacement has been measured by Mr. Huggins, and observers at Greenwich and others, and although there is considerable discordancy in the result, yet there is sufficient agreement to show that the true solution for the displacement has been attained.*

Owing to the extreme difficulty of observing the spectrum of a star when its light is sufficiently dispersed for reliable measures to be made, this elegant method of research has only yet been applied to a limited number of the brighter stars, and some results are shown in column 6 of the Table previously referred to. The radial velocities in this column are expressed in miles per second; those stars with the sign + before them are receding from, and those with the sign - are approaching the earth at the indicated velocities.

It is to be noticed, that out of this list eight stars have

* An actual proof of the correctness of this theory is found in the fact that the motion of the earth in its orbit can be distinctly traced in the varying values obtained for the radial motion of the stars at different periods of the year.

an assignable parallax, and seven have not; but there is no star which has both a known parallax and radial motion of less than the second magnitude; this is on account of the difficulty of perceiving the latter motion in the fainter stars with our present instruments.

We thus see that the combination of the quantities of parallactic, proper and radial motion are required in order to an exact knowledge of the distance and the amount and direction of stellar movement. The solution of all these problems may well be the arduous task of several generations of astronomers, but it is much to be desired that all the powers of a telescope of the largest size, combined with an efficient spectroscope, could be concentrated upon the determination of the radial motion of all stars which are suspected to have a parallax. By this means large advances in our knowledge of this question would soon be made.

It would be extremely interesting to know the amount of radial velocity of 1830 Groombridge, 61 Cygni, α Centauri, ϵ Indi, and μ Cassiopeiæ, all of which have large proper motions. And it would be of equal interest to determine the proper motions of Vega, Altair, Arcturus, and Capella, all of which have large radial velocities.

Having now exhibited something of the methods by which stellar movements and distances have been computed, let us consider very briefly how the application of this knowledge to the universe of stars (or suns, to speak more correctly) affects our views of their distribution.

We have seen by the Table of Parallax, that in all the universe our actual knowledge of distances of stars is limited at present to some twenty-five. It is scarcely probable that there are many stars nearer than any of these.

Since the discovery of proper motion, a question, which

from its very grandeur has caused considerable speculation, is that of a physical connection of all the stars.

Do they form an immense system, revolving in obedience to a central controlling power, after the manner of the planets round the sun? or is each one rushing along in its own orbit, exposed to the chance of collision with any other wanderer in trackless space?

Mädler's bold and romantic hypothesis that a central sun was to be sought in the neighbourhood of the Pleiades, was so attractive to the speculative mind, that it obtained a hold upon the popular imagination to which it was not in the least entitled.

Later endeavours in this direction appear only to show our present incapacity to deal with the problem. Yet I cannot refrain from giving you some results, published by Mr. Maxwell Hall,* in which the available data have been treated in an admirable manner. Mr. Hall has attempted, by a discussion of the parallax, proper motion and radial velocities of some twenty of these stars, to find the centre of a system with which they are dynamically connected. After a number of tentative experiments, in which the centre was sought in the Pleiades, in the cluster in the sword-handle of Perseus, in the congregated nebulae in Virgo, and in several other parts, he found two points diametrically opposite to each other, one in Andromeda, the other near Corvus, which gave satisfactory results; and he comes to this somewhat surprising conclusion, that the centre of the system with which our sun is connected lies upon the line passing through the sun and these two points at so great a distance, that the sun and nearer stars move about it with almost equal velocity; and that the centre is in the former of these constellations (at a point in R. A. $9^{\circ} 15'$ and N. P. D. $63^{\circ} 28'$), and that there is

* *Memoirs of the Royal Astronomical Society*, vol. 43, p. 157. *Vide* also *Monthly Notices of R.A.S.*, vol. 39, p. 126.

no conspicuous star near the place; the distance of the centre from the sun being about 31 millions of times the earth's distance from the sun.

The fact that certain conspicuous stars which are grouped in constellations have almost the same amount of proper motion with the same general direction, led Mr. Proctor to conceive that these stars were physically as well as apparently connected.

The most conspicuous instance is that of the five stars, β , γ , δ , ϵ , ζ , of Ursa Major, which with α make the well-known constellation of the Plough or Charles' Wain; these stars have all a common proper motion of about $0''.1$ per annum in the same direction, while α has the same amount of movement in an opposite direction.

This community of proper motion is very conspicuous among the stars of Cancer and Gemini, and those in the head Aries.

Professor Safford, of Massachusetts, has also investigated this subject, and has indicated six groups of stars where this star-drift is palpable.*

It seems impossible to doubt that in all these groups there is some physical connection; whether it will be *inter se*, or have a common relationship to the nearer stars of our system, has yet to be discovered.

The Radcliffe observer, Mr. Stone, shows, in an able paper,† that the theory of the average distribution of the stars according to brightness is most probably true. After discussing the questions of brightness and distance, he comes to the conclusion that the average distances of fainter stars must be greater than that of brighter ones.

No one has succeeded in ascertaining the parallax of a nebulae or cluster of stars. But now that stellar distances

* *Vide* Monthly Notices R.A.S., vol. 38, p. 296.

† Monthly Notices R.A.S., vol. 27, p. 233.

are known to be so immense, it is not (as formerly) supposed that these objects are other systems like ours, but condensed into little specks on account of their remoteness ; because the distance to which, in this supposition, they would have to be removed is utterly inconceivable, and they would altogether cease to be visible.

Moreover, there are circumstances connected with the distribution of these objects in the sky which indicate their connection with our system. This part of the subject is such a wide one, that we can barely glance at it. But the fact that nearly all the clusters of stars (*i.e.*, telescopic aggregations that are resolvable) are congregated in or about the galaxy, and are much less frequent in other parts of the sky ; and, conversely, that there are very few nebulae in or near the galaxy, and that they are densest in parts most remote from that zone, seems to show a connection with our system of these objects which is not without significance.

The best known aggregation of stars in the sky is the cluster of the Pleiades. Just let us consider its possible dimensions as a group, in order to show how little likely it is that any such cluster can be situated as an external, or, as the late Professor Nichols called it, an island universe.

No star in this cluster has a parallax equal to one-tenth of a second of arc ; but assume that this is the average parallax of the cluster, and that it has a shape approximately globular, then the distance of the furthest star from the nearest, in a straight line from the sun, will be equal to the apparent diameter of the cluster in tenths of a second of arc multiplied by the earth's distance from the sun, or $93,000,000 \times 72,000$, which is more than 1,200 times the extent of the solar system to its present known limit at the orbit of Neptune.

The distance of the centre of this cluster is at least two million times the radius of the earth's orbit, so that the remoter side of the cluster will extend beyond the nearer

about one-thirtieth part of its whole distance, or there would be a difference in the parallax of the central and extreme stars of $0''.016$, an amount which is absolutely inappreciable.

To many persons the idea that we cannot penetrate beyond our own system and witness varied stages of incipient, matured and dying universes beyond, is a distasteful one, because it seems to lessen the range of actual and potential vision; but may not the reality be the grander state of nature, a universe so vast that it is practically infinite, and which comprehends within its boundaries (if such a term is admissible) all the wondrous combinations and variety with which we are acquainted.

We cannot now (as we had hoped) discuss this part of the subject at length, nor can we touch upon the physical revelations of the spectroscope regarding the constitution of the stars.

Our object has been to show that our knowledge of this great subject is only in its infancy, and that a wider prospect is opening before us of a large generalisation in which the connection of all these objects in one grand scheme will be demonstrated.

STELLAR ELEMENTS.

STAR'S NAME.	Magnitude.	Parallax.	Sun's Distance from Earth, 93,000,000 of miles \times by	Proper Motion.	Radial Velocity.	Relative Distance \propto Centauri = 1.	Diameter \propto Cen. = Sun's.
α Centauri	0.6	.94	219,430	3.7		1.0	1.00
61 Cygni	5.5	.43	479,690	5.2		2.2	0.26
21185 Lalande...	7.5	.50	412,530	4.7		2.0	0.10
μ Cassiop.	5.5	.34	606,660	3.8		2.8	0.35
34 Groomb.	8.0	.29	711,260			3.2	0.13
21258 Lalande...	8.5	.26	793,330	4.4		3.6	0.11
17415 Oeltzen ...	9.0	.25	825,600			3.8	0.09
σ Draconis	5.0	.25	do.			3.8	0.6
Sirius	0.1	.23	896,800		+ 25	4.1	13.8
Castor	1.5	.20	1,031,320		+ 28	4.7	4.2
Altair	1.3	.18	1,145,930		- 50	5.2	4.8
η Cassiop.	4.0	.15	1,375,100			6.9	1.7
Arcturus	0.8	.13	1,586,700		- 40	7.2	19.0
ϵ Ur. Maj.	3.5	.13	do.			7.2	2.3
70 p Ophiuchi ...	4.5	.16	1,262,700			5.9	1.4
Procyon	1.0	.12	1,718,870		+ 30	7.9	7.9
Vega	1.0	.09	2,291,850		- 44	10.4	10.4
1830 Groom. ...	6.5	.09	do.	7.0		10.4	0.9
α Cygni	1.3	.08	2,578,300		- 45		
γ Draconis	2.6	.09	2,291,850			10.4	4.9
3077 Bradley ...	6.0	.07	2,946,640			13.4	1.3
Polaris	2.3	.06	3,437,780			15.7	8.7
85 Pegasi.....	6.0	.05	4,125,280			18.8	1.9
Capella.....	1.0	.04	5,156,600		- 30	23.5	23.5
ζ Indi				4.5			
δ^a Eridani ...				4.1			
Regulus					+ 30		
α Cor. Bor.					+ 25		
Betelgeuze					+ 50		
Rigel.....					+ 25		
α Androm.					- 33		
β Aurigæ					- 25		
γ U. Majoris ...					+ 62		

OLIVER WENDELL HOLMES—HIS WRITINGS
AND PHILOSOPHY.

By ROBERT FREDERICK GREEN.

To anyone entering upon the study of American literature a comparison between it and that of England is inevitable. Their common language—itself a bond of union such as exists between no other literatures—renders this easy, their common origin makes it almost imperative; and as the student takes up in their turn the histories, poems and novels America has produced, he finds himself instinctively comparing them with the histories, poems and novels he is acquainted with in England, and which have made our name famous. And the comparison is not altogether an unfair one. It is true that America is a young country; and a nation's literary life does not begin until she has made for herself a place among the kingdoms of this world; and it is true also that she has had a hard life, so far—has lived in troubled times; first, the fight for her liberty; and when that was won; and as it were almost before she had got breath after the struggle; there came that fiercer battle which we can only wonder she has ever survived at all. These, indeed, have not been the times for her men to write anything but a few patriotic verses and war songs; and if there had been no other influences at work she could hardly have produced anything more lasting than these. But on the other hand, though young as a nation, America is old as a race; and she

inherits from her English forefathers a birthright in books that it would indeed be a matter of surprise if she did not lay claim to and acknowledge. And as a matter of fact, I think we find that of the few men in her midst who have made their voices heard above the din of her battles and the bustle of her commerce; who have laid the foundation of the true American literature which is yet to come; the most powerful, if not the most noteworthy, are those who have in the fullest sense accepted their birthright, and who seem to have done their best to adapt it to the necessities of their time and country.

The great writers, then, of America may be divided into two classes. The first; who as I have said, are the most noteworthy; are those who follow in the steps of English and Old World literature; whose thoughts seem to run in much the same grooves as do ours; and whose writings, allowing of course for the differences of their social and political life, are readily comparable with the writings of our own day here. We have only to glance at the works of such men as Irving and Longfellow, Emerson and Bancroft, to see how true this is, and to see how nearly—on almost every subject—their thoughts are related to ours. And the other great class of writers are those who, like Whitman, Leland and Bret Harte, are, I think, more truly representative Americans; whose genius owns no English parentage; whose writings, whatever their faults or however great their power, are distinctly a product of their time, and can be judged of only by the power they possess to satisfy its immediate wants. And then, beyond this list, there is one man whom it is hard to class with either; who, though he yields to no one in his adherence to English forms of thought, or in his admiration of English literature; yet has at the same time such a deep true love for his own country, such a firm belief in her

institutions, such an implicit trust in her power, that if America had now to select out of her many millions one man to stand up and speak best for her to the world, she could not choose but name her greatest prophet, Oliver Wendell Holmes.

Oliver Wendell Holmes is the son of the Rev. Abiel Holmes, a clergyman of the Church of England, and Sarah Wendell. He was born on the 29th August, 1809, at Cambridge, a small town near Boston, Massachusetts, and was the fourth of five children; two only, however—John, a lawyer in Boston, and Oliver—are now living. His family, of which he is not a little proud, appears on both sides to be a very good one, and we find throughout his works constant reference made to certain distinguished members of it. One of his early and most characteristic poems is a soliloquy upon the fortunes of Dorothy Quincey, his “grandmother’s mother,” a young English lady, who left her home in Worcester to marry a poor colonist, and in whose birth and position we must, I suppose, find the explanation of Holmes’ slightly obtrusive—and with Americans somewhat unusual—stress on hereditary advantages. He is, in this respect at any rate, an Englishman; your true republican has few aristocratic ideas.

There is little of importance to record of Holmes’ childhood. His father seems to have been a man of more than ordinary intellectual power, highly conscientious, orthodox and popular among his brother clergymen; indeed, among Holmes’ earliest recollections we find those of “the old clergymen who filled our pulpit from time to time, and who passed the day under our roof.” “It was a real delight,” he says, “to have one of those good, hearty, happy, benignant old clergymen pass the Sunday with us, and I can

remember some whose advent made the day feel almost like "Thanksgiving." But now and then would come along a clerical visitor with a sad face and a wailing voice, which sounded exactly as if somebody must be lying dead upstairs, who took no interest in us children, except a painful one, as being in a bad way with our cheery looks, and did more to unchristianize us with his woe-begone ways than all his sermons were like to accomplish in the other direction. I remember one in particular, who twitted me so with my blessings as a Christian child, and whined so to me about the naked black children who, like the "Little Vulgar Boy," "hadn't got no supper, and hadn't got no Ma," and hadn't got no Catechism (how I wished for the moment I was a little black boy!) that he did more in that one day to make me a heathen than he had ever done in a month to make a Christian out of an infant Hottentot. . . . I might have been a minister myself, for aught I know, if this clergyman had not looked and talked so like an undertaker."

The old house at Cambridge was a very pleasant one—it is now included in the University buildings—and its long corridors, winding staircases and unexpected little rooms seem to have had a peculiar attraction for this strangely observant, mysterious little boy. One reads his descriptions of the dismal garrets and damp cellars, and there comes up at once the image of the child, wandering about in them alone, half frightened, yet determined to explore every corner. Even at this time he was fond of reading; he says, "I was born and bred among books, and have the easy feeling when I get into their presence that a stable-boy has among horses;" and he had begun, too, to have his likes and dislikes with regard to some of them. "I always, from an early age, had a keen eye for a story with a moral sticking out of it, and gave it a wide berth." He had his little garden, too, and gives a quaint account of his troubles, when flowers

would not bloom, and when grubs and caterpillars were more than usually plentiful and industrious. Altogether his childish days have been spent as childish days are perhaps best spent, quietly, happily, with no thought of the future, with no concern much for anything beyond his own immediate pursuits.

At fifteen, that is in 1824, Holmes was sent to boarding-school, to Phillips' Academy, Andover. He gives us, in a poem, "The Schoolboy," which was read at the school's centennial anniversary, some slight and ordinary enough account of his life there. There is nothing to notice, just the usual schoolboy reminiscences of home-sickness, mischievous companions and canings; he must, however, have made good progress in his studies, for we find him attempting a translation in verse of the first book of the *Æneid*. He stayed at Andover a little over a year, and then matriculated at Harvard University.

For three years now we hear nothing from Holmes of what he did, and we must infer that he quietly and steadily pursued his studies; he certainly wrote nothing after his first attempt at Andover until 1830, when the first of a number of short unconnected sets of verses appeared. Though too desultory and unimportant for criticism, these are interesting as his first work; they are some of them truly poetical, and are all written in that unstudied, happy style which has made his work so well known, and in the best sense, so popular. Holmes' first intention when at College was to go to the bar, and he studied law for the two years following his graduation; but in 1831, at the solicitation of some of his friends, he,—wisely as it has proved,—relinquished this purpose, and in the following year applied himself finally to the study of medicine, going for hospital practice to London and

Paris, and returning to Boston in 1836, where he took the M.D. degree at Harvard.

As might be expected, he wrote but little during these years; a few verses, chiefly humorous, and written, I believe, in England, are all we have to notice. He seems to have fully realised the necessity of making way in his profession, and for the present at any rate is content that literature should be a luxury, not an occupation. In 1836 was written, "Poetry, a Metrical Essay;" it was read at the inaugural meeting of the Φ . B. K. Society, a literary society connected with Yale College, and consisting at that time almost exclusively of the students. It is a long and elaborate poem, and is interesting, not only as Holmes' first important work, but as proving conclusively his ability to treat such difficult and ill-defined subjects clearly and philosophically. He speaks of poetry as a universal, mental quality; as existing in every one, and as being called forth only in particular individuals by their education and surroundings. This is of course quite contrary to the old idea of a "divine afflatus," an idea which, strange to say, Holmes accepts in his later works. We can gather also from the essay his definition of poetry. He speaks of it as the nearest possible approach to a perfect verbal expression of thought—the nearer, of course, the expression approaches to the thought, the truer the poetry. He says, for instance,

"Who reads aright will rarely look upon
A better poet than his lexicon."

I don't think this definition is a new one, and I don't know whether it is true, but it has at any rate a rare merit in poetical definitions, intelligibility. Though open to criticism in many of its opinions, the essay none the less clearly shows Holmes' complete mastery of his subject; a close, careful

analysis of it; and a logical force and power of expression which almost prevent the reader questioning anything he reads. It was published very shortly after being read, and, with the few earlier poems, constitutes the first edition of his works.

Again, and for some years now, we can say little of his literary work; he seems occupied chiefly with his profession, and is indeed rapidly becoming celebrated in it. Besides the Professorship of Anatomy at Dartmoor, he founded and carried on a medical school at Tremont, and had a large private practice. The appointment, too, at Dartmoor necessitated frequent lectures; two or three a week sometimes, for months together; so that with all this work on his hands, it is no wonder he wrote little for the world. What have been published are a few poems; a little more careful perhaps, and more serious than his first verses; but still disappointingly short, and when his life-work is considered, altogether unimportant.

It is necessary at this time to mention his marriage, on the 15th June, 1840, to Amelia Lee, daughter of the Hon. Charles Jackson. By it he has two sons, Oliver and John, who are both lawyers, and one daughter.

The little volume of 1836 is by this time beginning to do Holmes good service; it has become popular, and his neighbours, if they do not already think him a poet, are beginning to admire his verses. From that time to this he has been constantly in request for special poems; people seem to expect him to write to order, and indeed he seems able to do so. Here is a verse from a drinking song, written and read at a public dinner:—

“As o’er the glacier’s frozen sheet
Breathes soft the Alpine rose,
So, through life’s desert springing sweet,
The flower of friendship grows;

for the things to come true which she had been told, following her Son—oh, how anxiously!—as he goes about, and at the end hardly realising in her agony that his work is over. How true the closing words of the story are!—

“Youth fades; love droops; the leaves of friendship fall:
A mother’s secret hope outlives them all.”

In 1851 were commenced the meetings of “The Class of ’29.” It will be remembered that in that year Holmes graduated at Harvard, and now that so many of his fellow-students had become celebrated, it was thought that an evening spent together each year on their examination day would be a pleasant thing for all of them, and would help to keep alive the memory of that time when they were young, and had the world before them. It was a happy idea, and it has been happily carried out. Every year since, on the 8th January, “The Class of ’29” has met, and every year Holmes has had for their meeting a short poem, or a few verses, to help to make the time pass pleasantly. What a story these poems tell! How plainly we see in them that inevitable cadence—hope—joy—sorrow—sadness—to that calm, patient waiting for the end, which is perhaps the happiest disposition of all! How joyfully they met at first! Each vying with the other in recalling the days they spent together at College, greeting one another by the old names, calling themselves still “The Boys.”—Years go on; the meetings, pleasant still, are sadder, with thoughts of those who have left “The Class” for ever—who come no longer to its meetings to shake hands and laugh, and pretend they are young again; they miss welcome faces each year, and the verses in memory of those whose place is empty become occasional, frequent, at last ominously regular; there is no hearty laugh now—no boisterous meeting—but instead we see the earnest welcome of men who feel they are slowly but surely being loosed from

all that binds them to earth. At the meeting in 1880, Holmes read, as usual, his verses—let them speak for themselves :—

“THE SHADOWS.

‘How many have gone?’ was the question of old—

Ere time our bright ring of its jewels bereft;

Alas! for too often the death-bell has tolled,

And the question we ask is, ‘How many are left?’

Bright sparkled the wine; there were fifty that quaffed;

For a decade had slipped and had taken but three;

How they frolicked and sung,—how they shouted and laughed,

Like a school full of boys from their benches set free!

There were speeches and toasts, there were stories and rhymes,

The hall shook its sides with their merriment’s noise;

As they talked and lived over the college-day times,—

No wonder they kept the old name of ‘The Boys!’

The seasons moved on in their rhythmical flow,

With mornings like maidens that pouted or smiled,

With the bud and the leaf and the fruit and the snow,

And the year-books of Time in his alcoves were piled.

There were forty that gathered where fifty had met;

Some locks had got silvered, some lives had grown sere,

But the laugh of the laughers was lusty as yet,

And the song of the singers rose ringing and clear.

Still flitted the years; there were thirty that came;

‘The Boys’ they were still, and they answered their call;

There were foreheads of care, but the smiles were the same,

And the chorus rang loud through the garlanded hall.

The hour-hand moved on, and they gathered again;

There were twenty that joined in the hymn that was sung,

But ah! for our song-bird we listened in vain—

The crystalline tones like a seraph’s that rung!

How narrow the circle that holds us to-night!

How many the loved ones that greet us no more,

As we meet like the stragglers that come from the fight,

Like the mariners flung from a wreck on the shore!

Slow from the shore the sullen waves retire ;
His form a nobler element shall claim ;
Nature baptized him in ethereal fire,
And Death shall crown him with a wreath of flame.

Fade, mortal semblance, never to return ;
Swift is the change within thy crimson shroud ;
Seal the white ashes in the peaceful urn ;
All else has risen in yon silvery cloud.

Sleep where the gentle Adonais lies,
Whose open page lay on thy dying heart,
Both in the smile of those blue-vaulted skies,
Earth's fairest dome of all divinest art.

Breathe for his wandering soul one passing sigh,
O happier Christian, while thine eye grows dim,—
In all the mansions of the house on high,
Say not that Mercy has not one for him !”

In November, 1857, was published the first number of the *Atlantic Monthly Magazine*, under the editorship of James Russell Lowell. “Its foundation,” said Holmes, speaking of it many years later, “was due to the liberal enterprise of the then flourishing firm of Phillips & Samson, but the idea of its production originated among a coterie of literary men, who used to meet at a bookseller’s shop in Boston, and who afterwards formed its chief contributors. Longfellow, Emerson, J. L. Motley, and Edmund Quincey are men whose writings would make any magazine succeed ; and there is no doubt that the present position of the *Atlantic* is largely due to their efforts. Holmes is one of the original contributors, and wrote for it his first prose work, “The Autocrat at the Breakfast Table.” “The work,” says Mr. Underwood, in his article on Holmes in *Scribner’s Monthly*, “took people by storm ; the sedate critics did not know what to make of the thing ; some thought it undignified, others professed to be only more con-

firmed in their opinion that Holmes was an inordinate egotist. The suckling reviewer undertook to put the puns under his microscope for analysis; the solemn purist lamented the tendency to slang, and while he admitted the brilliancy of the poems that were interspersed, he thought they showed as ill as diamonds among the spangles of the court fool." The papers are a series of opinions—they are so one-sided that we cannot call them conversations—on all kinds of subjects, expressed by a middle-aged gentleman at the breakfast table of a Boston boarding-house. The company is a sufficiently representative one. There is a divinity student—"a rather nice young man," says the Autocrat, "and I think he has an appreciation of the higher mental qualities remarkable for one of his years and training." Then there is "the young man called John,"—uncommonly sharp, practical, amusing, and it must be confessed, "cheeky." The schoolmistress—a pale-faced, overworked, highminded woman, a type of nearly all Holmes' female characters; I think she is intended to represent his wife, at any rate the Autocrat marries her in the story.

There are other characters less important—the coarse, essentially commonplace and vulgar business man; the only character which makes Holmes lose his temper, and one which, under different names, he delights to portray in all his works, and to say all the hard things he can about—a temporary boarder from the country—"an economically organized female,"—the landlady, and some others—in all, a very usual assemblage, and one that can be made responsible for a great variety of opinions.

It is rather interesting, however, to notice the characters which Holmes chooses as representatives of certain lines of thought. The divinity student, for instance, is intended to show us the mind—powerful and active on all sides—but whose grasp has been cramped, as it were, by its education—

a by no means conventional theologian, but one who does his best to settle in accordance with his teaching the difficulties he cannot help seeing surround him; holding to his doctrines none the less honestly and defending them none the less manfully that he sees how hard they are to defend, how impossible of reconciliation with any pretence to intellectual freedom. The support of a hard-and-fast, literal adherence to the old puritan doctrines; and the state of mind which utterly repudiates facts which appear to disagree with them in any way; is relegated to the "economically organized female in black bombazine"—a very well-meaning woman, no doubt, but sadly thick-headed and ignorant.

The schoolmistress and "the young man John" are very pleasant representatives of the ideal and the practical mind; the one looking *into* things, with a wish to find out what is best in them, and to judge them by that only; the other, equally observant, equally capable of instituting comparisons, but insisting that things shall *be* what they *seem*—profoundly careless as to their meaning—one whose quick wit and practical sense seem much better adapted for the battle of life. The two characters are a splendid contrast, and as far as I can see, are perfect examples of the men and women they typify.

Such a work as the "Autocrat" must necessarily be, to a great extent, egotistic, and as we have seen, the critics were not slow to bring this charge against Holmes; he defends himself well, though. He has had, one time and another, pretty sharp battles with these gentry, and I think, on the whole, hasn't come off second best. I wish he wouldn't *explain* his reasons, though. I don't like justifications, least of all, by an author of his works; they always seem to imply a certain sense of weakness in one's position, and I cannot help thinking that the "explanations" we meet with in the earlier portions of the "Autocrat" are intended to justify;

but then, they are such happy retorts, such brilliant defences, that one is almost thankful to the critic for having called them forth.

There is no attempt at any connected narrative in the "Autocrat;" and any definite purpose in it, beyond that of amusing intelligently; is not very easy to see. Holmes seems chiefly to try and make ordinary men and women think a little more deeply; he shows them that the consideration of philosophical questions is not necessarily dry and uninteresting, and he sees how much better for the world it would be if men were brought to consider these for themselves, instead of leaving their settlement, as they are content now to leave it, in the hands of others; and so he seems first to try and give men subjects for thought; he speaks of matters that have a personal interest for them—their politics,—what a glorious thing their freedom is, and what great results it can accomplish if it is rightly used—their social intercourse,—its duties and its dangers—and last,—that greatest of all subjects with him,—their religion. There is a remark I sometimes hear made about certain clergymen, whose opinions or abilities are stronger, perhaps, than the average, that they are "educating" their congregations—are making them, by the strength of their own convictions, or by their power of argument, believe as they do; and surely no clergyman ever educated his congregation as Holmes does those who read his works! Beginning in the "Autocrat," there runs through all this one idea, this one great determination—men must be brought, on this and on all other subjects, to think for themselves—there must be no more blind dependence on the opinion of others. A man's own reason must answer for him. To that stern tribunal must all questions be brought sooner or later, and with its verdict he cannot choose but abide—there is no higher court of appeal. We cannot discuss here whether or not Holmes is right, whether reason or authority is to guide

a man through life ; but as I say, it is his greatest subject, and if he does not teach his readers how much safer—with all its dangers,—is freedom of thought, than the acceptance,—no matter how faithful,—of creeds; he can teach them nothing. I have spoken at some length about the “ Autocrat,” because, though Holmes’ first work, it is in many respects the most important, as well as being the best known. It is important from the knowledge it gives us of his character and opinions. We seem to see the man in his writings, and to feel instinctively that he is not putting on any conventional mask, but speaking truthfully and earnestly as he really feels ; and I am afraid it is his most popular work, chiefly because it is most witty, the humour is more easily recognisable, more popular and I think less delicate, than in his later works.

Immediately on the completion of the “ Autocrat,” Holmes commenced another series of papers in the *Atlantic*—“ The Professor at the Breakfast Table.” This is, in many ways, a very great improvement on the previous series, to which it forms a sequel. Holmes still pursues his favourite subject, freedom of thought, but with greater force ; he is more bold in defence of the opinion he knows is right, more aggressive in his antagonism to what he feels is wrong. At the same time, too, he is more inclined to listen to others’ opinion, more tolerant of it when it disagrees with his. There are but few new characters introduced. The Autocrat and Schoolmistress have left, of course ; and the place of the former is taken by the Professor. There is another arrival, a little deformed old man, “ whose whole appearance,” says the Professor, the first time he saw him, “ was so grotesque, I felt for a minute as if there was a showman behind him who would pull him down presently, and set up Judy, or the hangman, or the Devil, or some other wooden personage of the famous spectacle” He is a splendid character, though,

and his patriotism and pride in his country are unbounded. The company agree to call him "Little Boston," because he persists in talking of that town as if it were all America, and becomes highly indignant if any other place is compared with it. Then there are two lady lodgers—one middle-aged and prim, who is so oppressively good that the Professor calls her "The Model," and the company all hate her accordingly; she is the guardian of a young girl who is with her, by name "Iris." It is easy to find fault with the story of "Iris,"—Holmes' first prose narrative. It is short, terribly fitful and disconnected; but its deep, true pathos appeals irresistibly to all our sympathies, and it will be read when many of his more complete works are forgotten. The Professor is little more definite or connected in his choice of subjects than his predecessor; but his conversation is deeper, more serious. The work is for this reason less popular, but it is far more lasting, and the opinions expressed are more valuable, because more careful and considerate.

The hint of a future novel, conveyed by the story of "Iris," was fulfilled in Holmes' next work, "Elsie Venner: a Romance of Destiny." Considered only as a novel, I think this is on all hands admitted to be a failure; the plot is weak and disconnected, the dialogue strained and unnatural, the story simply horrible; and yet, as a necessary part of his teaching, as a defence of his best-maintained position on the ground of moral philosophy, it will have to be one of the most carefully studied of his works. The story is not a pleasant one to think or speak of; the heroine, "Elsie Venner," becomes in some mysterious way imbued from her birth with the nature of the rattlesnake; she is impelled by an irresistible impulse to be near these reptiles, to watch them, imitate them, to try as they do to fascinate people, and then, when they are helpless, kill them. She is represented as

having all their heartless cruelty, all their strange antipathies, all their repulsive beauty, and yet as being human too, as having something in her of that kind, gentle woman-nature which Holmes loves so well, and speaks of so often; and it is her vain struggles against the awful fatalism hanging over her which make the reader of the story shudder, and close the book in very fear. This may sound like exaggeration, but it is not. Some of the sketches of Edgar Allan Poe and the novels of Wilkie Collins are the only works I know of that produce anything like the impression this does. The characters in "Elsie Venner" are very similar to those spoken of in the "Autocrat" and the "Professor," but are, of course, under different names. Holmes himself is represented by a very well-informed Doctor of Medicine, to whom the hero of the story writes, and who gives his opinion in a way that shows us he is still living at the Boston boarding-house. The novel, which appeared as a serial in the *Atlantic*, was concluded in 1860; and for the next six years that magazine had comparatively little from Holmes' pen. He had other work to do.

On the 21st of July, 1861, was fought the battle of Bull's Run, and the event of that day made clear to every American who loved his country the duty of abandoning every personal interest, and doing all that he could do to help her in that—the hour of her greatest need. Is not Holmes' duty clearly marked out now? Is not now the time, if at all, when he must make his words sink deep into men's hearts, and rouse them to patriotism? Is not this the time to remind them of the heritage their fathers had left; of how it had been won; of the disgrace to them of losing it? Is it not now the time for a prophet to make his voice heard among his countrymen, and to proclaim to them their duty in no uncertain tones? Surely it is! and surely Holmes in this

proves himself a true prophet if America had no other.
Listen to one of his appeals:—

“NEVER OR NOW.

AN APPEAL.

Listen, young heroes! your country is calling!
Time strikes the hour for the brave and the true!
Now, while the foremost are fighting and falling,
Fill up the ranks that have opened for you!
You, whom the fathers made free and defended,
Stain not the scroll that emblazons their fame!
You, whose fair heritage spotless descended,
Leave not your children a birthright of shame.
Stay not for questions while Freedom stands gasping!
Wait not till Honor lies wrapped in his pall!
Brief the lips' meeting be, swift the hands' clasping,—
‘Off for the wars!’ is enough for them all.
Break from the arms that would fondly caress you!
Hark! 'tis the bugle-blast, sabres are drawn!
Mothers shall pray for you, fathers shall bless you,
Maidens shall weep for you when you are gone!
Never or now! cries the blood of a nation,
Poured on the turf where the red rose should bloom;
Now is the day and the hour of salvation,—
Never or now! peals the trumpet of doom!
Never or now! roars the hoarse-throated cannon,
Through the black canopy blotting the skies;
Never or now! flaps the shell-blasted pennon,
O'er the deep ooze where the Cumberland lies!
From the foul dens where our brothers are dying,
Aliens and foes in the land of their birth,—
From the rank swamps where our martyrs are lying,
Pleading in vain for a handful of earth,—
From the hot plains where they perish outnumbered,
Furrowed and ridged by the battlefield's plough,
Comes the loud summons; too long you have slumbered,
Hear the last angel-trump,—Never or now!”

But Holmes had a duty even higher than that of inciting men to battle—a duty to those at home. *He* could see this horrid war in its true colours ; it meant more to him in his educated intelligence than to the thousand and one nobodies who raved day after day for news ; and seeing it so truly, he sees another duty in it, too. The duty of showing men that there were those who, with patriotism as noble as any, could yet, even in the midst of that wild excitement, compel themselves to look calmly on affairs, to see if there was no happier side to them—no silver lining to that black cloud. This is no easy task ; but Holmes makes it his, and performs it nobly. One of his articles, entitled “Bread and the Newspaper,” which appeared about this time in the *Atlantic*, shows us how earnestly he feels his country’s troubles ; the words are—as his always are—calm, tolerant, unprejudiced ; but we can trace beneath them an under-current of the deepest emotion. He points out clearly and truthfully the lessons that the war was teaching—the good it was doing to the men who fought and the nation they fought for. In its annihilation of those petty social distinctions which had so long checked friendly intercourse ; in its showing men how small were their long-fought religious differences, when they had to die together ; in its proving that “patriotism is eloquence and heroism is gentility,” he shows us that the war was no curse, but a true blessing.

From 1861 to 1864 we find Holmes writing poems, magazine articles, delivering orations, but always about the war ; he can only think of that now—we must wait till times are quieter.

After this he drops again into his old habit of writing verses, but they are nearly all by request. He is looked upon as the laureate of Boston ; and whenever an important personage arrives or takes his leave, or there is a banquet to be given, Holmes must bring one of his happy appropriate

songs to make the affair a success. In 1867 appeared his second novel, "The Guardian Angel." It is first of all a great improvement on the previous work; the plot is a happier one, and much more carefully worked out; the dialogue is less strained, and the characters more natural; there is still a hankering after the wierd and mysterious, and still the same tendency to wander off into a lot of unnecessary disquisitions; but these faults, if they are faults, are less noticeable, and do not so much interfere with the reader's enjoyment. The idea involved in the story is a similar one to that of "Elsie Venner;" but though I think it not a whit more natural or true, it is less revolting, and much more readily comprehensible. The heroine, "Myrtle Hazard," a beautiful young girl, is subjected to a succession of influences from her ancestors; their predominate, and often opposite, traits of character appear in her at different periods of her life, and for the time take, as it were, possession of her character. The idea is a new one with Holmes, and we must refer to it later. Again, we see the same characters—the literally religious woman, ignorant and bigotted—the practical unscrupulous man of the world—the honest high-minded woman—but there is a new one, whose advent is significant—a clergyman, apparently holy, and whose rigid observance of the ceremonies of his religion is noticeable, if not ostentatious; but whose low, brutal nature is depicted with a force which must have been the result of very strong convictions. Holmes himself is in the tale again, of course. We never lose sight of him in any of his works, and we are only prevented, by his utter abandonment of disguise—by the instant recognition of Byles Gridley, M.A., for that is his name here—from agreeing with the American critic, that "he is a consummate egotist." As a philosophical work, "The Guardian Angel" is obviously intended as a development of previous propositions; these are stated more definitely, more

clearly, and we can see—particularly with regard to theology—that Holmes is willing and quite able to fortify the position he has taken.

His next published work is an essay, "Mechanism in Thought and Morals," delivered in 1869, at one of the inaugural meetings of the Φ .B.K. Society. It is interesting, as a clear and popular statement of his opinions in this branch of philosophy; but to the student of his works, it is somewhat unsatisfactory; the ideas are not new, and the arguments are nearly all taken from his earlier works. As Ruskin says,—the knowledge it has cost a man half his life to get cannot be sweetened up and made into palatable pills, for an audience to take at an hour's lecture. Even Holmes—good lecturer as he is—cannot do his subject justice if he has first of all to please his audience.

Until 1871, Holmes' only contributions to the *Atlantic* were a few critical notices of books that took his fancy; but in that year he commenced the third and last of the Breakfast Table Series—"The Poet." It was wanted, some sequel such as this to the "Autocrat" and "The Professor," some such conclusion to a philosophy hitherto only disappointedly critical and destructive, and it was to be looked for, this softening down of his aversions, and this growing desire to make the best of men as they are, instead of wishing them something different; and it is significant enough that Holmes, before he lays down his pen, seems trying to teach us that after all it is better for a man to strengthen his moorings to this social sandbank than to seek new anchorage. We see in "The Poet" the same versatility, the same quick insight into men and manners, the same keen sense of humour, which is characteristic of Holmes in all his writings; but we see too, plainly, that his work as a teacher of men is over. He has

educated his congregation as far as his strength will let him, and he must rest now, and watch the work of others who come after. There are no new discussions, few fresh opinions advanced, and there is little to make the book popular. Holmes is as plain spoken and as honest as ever, but more kindly; and though he writes in the first person still, we see little of the humorous dogmatism that characterises the "Autocrat" and the "Professor." The characters are, many of them, new; the most interesting being a scientific specialist, who studies beetles, and who is called, in consequence, the "Scarabee." "He has come" (says the Poet) "to look wonderfully like those creatures—the beetles, I mean—by being so much among them. His room is hung round with cases of them, each empaled on a pin driven through him, something as they used to bury suicides. These cases take the place for him of pictures and all other ornaments. That boy steals into his room sometimes and stares at them with great admiration, and has himself undertaken to form a rival cabinet, chiefly consisting of flies, so far arranged in ranks, superintended by an occasional spider." Then there is another of Holmes' ill-used heroines, who writes tales for a weekly journal, and gets sadly treated by the critics, and whom he calls "Scherazade." And last, there is his ideal critic, "a person of whom we know little, except that he carries about him more palpable reminiscences of tobacco and the allied sources of comfort than a very sensitive organisation might find acceptable." The reminiscences of Holmes' early life, which he gives us in the "Poet" are very beautiful; he is getting old now, and seems to look back—as I suppose men do—on the days of his youth, with a sad regretful pleasure.

On the 29th May, 1877, died John Lothrop Motley, author of the well-known "Dutch Republic;" and at a meeting of the Massachusetts Historical Society at Boston, on

14th June, Holmes was requested to write his memoir; he did so, and read it at a subsequent meeting; but there were certain political references not possible of introduction into the Society which he did not feel justified in passing over, and he therefore re-wrote the memoir for publication. It is a work that must stand very high among biographies; if a little partial, it is never unjust—no man can be absolutely unprejudiced—and we can sympathise with a partiality born of the truest friendship, and with a determination to make known to the world, and to set right as far as possible, a very great injustice. The story of Motley's ambassadorship in England, and of his recall by the American government, will be remembered by all here, and we can understand Holmes' indignation that his country should have so spitefully injured one of its best servants.

Since this memoir, Holmes has written very little, but very carefully; an occasional article for some American magazine, and an occasional poem—that is all. They show us that he has lost little of his old power—that he is still able to carry his readers irresistibly along with him; but they show us also a growing disposition to lay down at last the pen he has so long and so faithfully wielded.

"The publishers of the *Atlantic Monthly Magazine* ask the pleasure of your company at a reception and breakfast, to be given at the Hotel Brunswick, Boston, on Wednesday, 3rd December, 1879, at 12 o'clock, in honour of the seventieth birthday of OLIVER WENDELL HOLMES."

This card of invitation was sent to all the *Atlantic* contributors, and to the chief literary men of America. The breakfast—which was unavoidably postponed from Holmes' real birthday, on August 29th—was a thorough success, and was a very graceful acknowledgment by the *Atlantic* proprietors of the work Holmes had done for them. It was attended

by a very large number of eminent persons, and the happy songs and speeches made at the meeting show us how great is the influence he has over the hearts of the best and wisest of his countrymen. His own speech at the breakfast, entitled "The Iron Gate," has been since published, and we cannot conclude any notice of his literary works without reference to this truthful summary, this beautiful and earnest farewell to his fellow-workers :—

* * * * *

" Youth longs and manhood strives, but age remembers,
 Sits by the raked-up ashes of the past,
 Spreads its thin hands above whitening embers
 That warm its creeping life-blood till the last.
 Dear to its heart is every loving token
 That comes unbidden ere its pulse grows cold,
 Ere the last lingering ties of life are broken,
 Its labours ended and its story told.
 As on the gauzy wings of fancy flying,
 From some far orb I track our watery sphere,
 Home of the struggling, suffering, doubting, dying,
 The silvered globule seems a glistening tear.
 But Nature lends her mirror of illusion
 To win from saddening scenes our age-dimmed eyes,
 And misty day-dreams blend in sweet confusion
 The wint'ry landscape and the summer skies.
 So when the iron portal shuts behind us,
 And life forgets us in its noise and whirl,
 Visions that shunned the glaring noonday find us,
 And glimmering starlight shows the gates of pearl.
 —I come not here your morning hours to sadden,
 A limping pilgrim leaning on his staff,—
 I, who have never deemed it sin to gladden
 This vale of sorrows with a wholesome laugh.
 If word of mine another's gloom has brightened,
 Through my dumb lips the heaven-sent message came ;
 If hand of mine another's task has lightened,
 It felt the guidance that it dares not claim.

Q

strongly. His verses, as we have seen, have been nearly all written for some special purpose, and they necessarily lose much of their value when that is fulfilled; but his essays and novels have no such narrow aim. They are as Byles Gridley says, "thoughts on the universe"; opinions of men and manners; and as such must always be valuable to us. There are few men in America who have Holmes' ability to observe and so rightly estimate human character, and there are still fewer who have had his time and opportunity to do it.

Of style, in his earlier works, we see little. The Breakfast Table series are too conversational, too disconnected for any noticeable regularity in the arrangement of words; and it is only when we take up his novels and latest essays that we see the writer he resembles. Holmes' literary prose style is almost a reproduction of that of our own novelist, Charles Dickens. Of course it is not very easy to substantiate such a statement as this. Analogy in style is an impression conveyed not by the comparison of a few pages of men's writings, but by their whole works; and it is difficult therefore to give examples. The opening chapter of "The Guardian Angel," and the descriptive pieces in "Elsie Venner," may, however, be cited as passages where the similarity of the two writers is most striking. This imitation—for it is nothing less—of Dickens is not at all surprising when we see how much Holmes admires him. It has become lately a kind of fashion here to speak slightly of Dickens and of the work he did, and I think Holmes' appreciation of him should make us more careful to find out whether is wanting, not his genius, but our own ability to understand it. Great intellects are seldom wrong in their ideals; and when we see Holmes fixing on men like Göthe and Schiller, Voltaire and Béranger, Shakespeare and Burns, as the master-minds to be followed; it is at least probable

that he makes as little mistake in his opinion of our great novelist. Dickens, though, is not the only writer who has influenced Holmes' style. We come across here and there in his works traces of others; of Fielding—in the introductions to chapters and in the disquisitions; of Thackeray—in most of the satirical chapters. There is an account in "Elsie Venner" of a certain Colonel Sproale's party which reminds us very forcibly of "A Shabby Genteel Story."

One great attraction of Holmes is of course his humour. It is so delicate and refined; more appreciable perhaps than Elia or Leigh Hunt; but still existing, as it were, only by implication, and quite as liable as theirs is to be passed unnoticed by the careless reader. It is with Holmes as with all true humorists—you laugh *with*, never *at*, him; there is something ludicrous in the idea conveyed, while the words are serious enough. It is useless attempting any illustration of this; not a single passage will bear taking from the context. We have not space to speak now of his many other attractions—of his love of nature; that deep true communion with her which seems the birthright of poets—of his manly admiration for art—of his aphorisms; bright, sparkling sentences which have only to be a little older to become every-day proverbs—of his quiet yet unsparing denunciation of all affectation and vulgarity—these must be left for the reader, who only can properly appreciate them.

We cannot call Holmes a critic, although he possesses to an eminent degree the critical faculty. He is too sympathetic, too willing to make allowances; he tries too much to put himself in the writer's—instead of the reader's—place. It is the duty of a critic—if he is to be of any more use to the world than a sandwich-man—to think and examine for the men who are to read; to think deeper than they *will*,

certainly—perhaps than they *can*—but still to think for them, and not for the man who has written. Holmes' opinions on the subject, if there were nothing else, would prevent us putting very much faith in his criticisms. He says:—"I believe in the school, the college, and the clergy; but my sovereign logic for regulating public opinion—which means commonly the opinion of half-a-dozen of the critical gentry—is the following *Major proposition*. Oysters au naturel. *Minor proposition*. The same "scalloped." *Conclusion*. That — (here insert entertainer's name) is clever, witty, wise, brilliant, and the rest I love truth as chiefest among the virtues; I trust it runs in my blood; but I would never be a critic, because I know I could not always tell it. I might write a criticism of a book that happened to please me; that is another matter."—And that is all he has done.

In philosophy, I fear Holmes is not very consistent. As a poet, he must be an idealist; as a scientific man, more or less a materialist; and between these two positions the student meets with very different and contradictory ideas. It is not necessary, and indeed I am quite incompetent, to speak of his poetical philosophy; with its usual personification of abstractions, and its beautiful, misleading imagery; but in his prose—as a moral philosopher—there is little ambiguity. We see at once that he is an ardent materialist. If he does not go the length of saying that consciousness is nothing more than the result of an organism, he admits that it is inconceivable as existing separately. He shows plainly what very few people now are disposed to deny—that the moral power of a man is dependent on the physical; but he goes further, and says that both are subject to the same laws of heredity and environment. All through his novels, this idea—the influence of moral inherited tendencies over the

physical organism—is being worked out. Just hinted at in “The story of ‘Iris ;’” shown to us with terrible clearness—and yet as to some extent controllable—in “Elsie Venner ;” and in “Myrtle Hazard” as having become omnipotent, as possessing her completely, rendering her irresponsible for her actions. Men are born with physical deformities ; sometimes inherited, and sometimes—as far as we can see—accidental ; can we deny also that they are born with mental deformities just as much beyond their control ? This is dangerous ground ; and though he professes to speak plainly, Holmes sees it, and I cannot help thinking, shirks the subject a little. Why should he shirk it ? And, if it is true, why should we ? Is it because that in admitting the existence of these moral cripples, we admit at the same time our utter inability to deal with them ? Because we think it safer,—as it is easier,—to shut our eyes to facts ; and, pretending that all men are born perfect, to punish them when we find they are not ? Education is a great power and can do great things ; but it is not, as some men now-a-days would have us think, a panacea. When we educate a child whose mind is like its body, healthy and active, it is all very well, and the results are good ; but when it is “training *versus* nature,” we often see our helplessness. Automatic moral action is a nice-sounding phrase enough in Holmes’ book ; but apply it to the poor wretches in our police courts, and it begins to be unpleasantly suggestive.

Holmes takes us thus far, and stops short, as well he may ! It must be a bolder man even than he, who will admit and make provision for such a factor in our ethics.

ON A COLLECTION OF POLYZOA, FROM BASS'S
STRAITS, PRESENTED BY CAPT. W. H. CAWNE
WARREN TO THE LIVERPOOL FREE MUSEUM.

BY THE REV. THOMAS HINCKS, B.A., F.R.S.

CAPTAIN Warren has rendered good service to zoological science, and has shown what may be done by an intelligent use of the opportunities for collecting natural objects which belong to his profession.

The collection of *Polyzoa*, chiefly from Bass's Straits, which he has presented to the Free Museum, and upon which I have been asked to report, is large and important; it is rich in new forms, and is a valuable contribution to our knowledge of the fauna of the South Australian waters. It has also supplied me with some structural and physiological facts of much significance, and has therefore more than a merely faunistic interest.

We have already had a special report on the Polyzoan fauna of Bass's Straits. In the year 1848 dredgings were made in this region by the Naturalists attached to H.M.S. "Rattlesnake," then engaged on surveying duty off the Australian coasts. The *Hydroida* and *Polyzoa* obtained were submitted for examination to Mr. Busk, and his Report upon them is published in an Appendix to the "Narrative of the Voyage" (1852), by John MacGillivray, the Naturalist to the Expedition. At that date little was known of the Polyzoa of Australia, and a large number of very interesting forms were for the first time characterised. Forty-one species are recorded from Bass's Straits in Mr. Busk's list, and of these thirty-one were new to science. Subsequently (1858) Sir Wyville Thomson published a number of new forms from

the same locality, which he had obtained amongst the collections of the distinguished Algologist, the late Prof. Harvey. In Mr. Busk's "British Museum Catalogue," some additional species are reported from the Straits and from the Tasmanian coast; whilst the researches of P. H. MacGillivray and other Australian workers have brought to light a rich Polyzoon fauna on the adjacent shores of Victoria. After all that has been done, however, much remains to be accomplished, as Captain Warren's collection plainly shows.

The dredgings which have been placed in my hands are comparatively small in amount, but they have yielded no less than ninety species, of which (so far as I know at present) twenty-three are new. This is a most satisfactory result, and I may be allowed to congratulate the Liverpool Free Museum on the acquisition of a collection which will be of permanent value to the student of the Polyzoa.

Of the species which occur, twenty-two are European forms which inhabit our own coasts. Of the rest, a large proportion have only been found, so far, in the Australian seas.

In the accompanying List I have given a diagnosis of all the new forms; they will be figured in the July number of the *Annals and Magazine of Natural History*.*

LIST OF SPECIES.

Subkingdom MOLLUSCA.

Class Polyzoa.

Subclass HOLOBRANCHIA, Lankester.

Group ECTOPROCTA, Nitsche.

Order Gymnolœmata, Allman.

Suborder CHEILOSTOMATA, Busk.

* See *Annals of Natural History* for July, 1881, pp. 49-62, pl. i., ii., iii., and August, 1881, pp. 64-70, pl. iv.

Family Eucratiidæ.

EUCRATEA, Lamouroux.

E. chelata, Linn. Off Curtis Island, creeping over
Bicellaria grandis.

DIMETOPIA, Busk.

D. cornuta, Busk.

Family Catenicellidæ.

CATENICELLA, De Blainville.

C. ventricosa, Busk. Off Curtis island; very common.

C. plagiotoma, Busk, var. *setigera*, MacGillivray.

C. cornuta, Busk.

C. Wilsoni, (?) MacGillivray. Of a dark brown colour,
growing in large tufts.

C. umbonata, Busk.

C. ? sp. One of the "vittate" section, undetermined.

CALPIDIUM, Busk.

C. ornatum, Busk.

Family Cellulariidæ.

CELLULARIA, Pallas.

C. cuspidata, Busk.

SCRUPOCELLARIA, Van Beneden.

S. ornithorhyncus (?), Wyville Thomson.

The specimens which I refer doubtfully to this species differ in several respects from Sir W. Thomson's description and figure. He represents the lateral avicularia as very large, and the vibracula as small and obscure; but the very opposite may be said of the present form. The operculum is described as "prolonged upwards into a spine;" in Capt. Warren's specimens it is produced above into a process, which is truncate at the extremity; below it is rounded off, and completely covers the orifice, differing much in appearance from Sir W. Thomson's figure. The question of the

identity or otherwise of the two forms must be left for future settlement.

CABEREA, Lamouroux.

C. rudis, Busk.

C. grandis, n. sp.

Zoarium, dichotomously branched. *Zoecia* in 3-6 rows, short, subquadrate, aperture occupying almost the whole front, subelliptical, sunk, the border inclosing it minutely roughened, two spines on the outer side above, and one on the inner; operculum with a very broad peduncle, entire, pretty regularly oval, with a loop-like marking across the centre; on the outer edge of the marginal cells, a little below the vibraculum, a small sessile *avicularium*, elongate, tapering off to a point below, the upper extremity occupied by a triangular mandible; below each of the inner cells two small raised *avicularia*, with pointed mandible directed downwards; occasionally gigantic *avicularia*, resembling those on the marginal cells (except in size), distributed over the zoarium. *Vibracular grooves*, extending to the very base of the organ; seta of very great length, and serrate. *Oecium* immersed, smooth, front flattened, surrounded by a raised border.

Off Curtis Island.

CANDA, Lamouroux.

C. arachnoides, Lamouroux.

Family Bicellariidæ.

BICELLARIA, De Blainville.

B. grandis, Busk.

DIACHORIS, Busk.

D. Crotali, Busk. In the clefts and hollows of a mass of *Cellepora*, forming branched suberect fronds.

D. spinigera, MacGillivray. A single specimen.

Family Cellariidæ.

CELLARIA, Lamouroux (part).

C. fistulosa, Linn., var. *Australis*, MacGill. Very common.

C. tenuirostris, Busk. Common.

Family Flustridæ.

FLUSTRA, Linnæus.

F. dissimilis, Busk.

Family Membraniporidæ.

MEMBRANIPORA, De Blainville.

M. lineata, Linn. On shell.

Geographical range: Arctic seas; Britain; N. America; Baltic; Adriatic; New Zealand.

M. inarmata, n. sp.

Zoæcia ovate, placed closely together in lines, alternate; aperture occupying the whole of the front, with membranous covering; margin raised, thin, smooth, bearing on each side from four to six tall, straight, silvery, pointed spines, which are slightly inclined inwards towards the centre; at the top a single erect spine on each side. *Avicularia*, none. *Oæcium* rounded, very shallow, just covering the extremity of the cell, smooth, silvery, often projecting into a point in front, with a broad, calcareous band (formed by the lower margin of the cell above) stretching over it.

On shell.

M. cervicornis, Busk.

Common, spreading sometimes in very large patches over shells, *Cellepora*, &c.; of a rich purplish colour.

M. Savartii, Audouin.

M. pyrula, n. sp. (= *M. lineata*, MacGillivray, "Polyzoa of Victoria," in M^r Coy's "Prodromus.")

Zoæcia pyriform, quincuncial, hyaline, silvery; area elongate-oval, occupying three-quarters of the length, wholly covered in by membrane, surrounded by a thickened border, from which

spring, on each side, four broad, flattened spines with an expanded base, which bend over the area and meet in the centre; a single spine at the bottom, or sometimes two or three; on each side of the semicircular orifice, at the extreme top of the area, an erect spine; the portion of the cell below the area smooth and glassy, the base subtruncate, or sometimes pointed. Large, elongate, subspatulate *avicularia*, with dark-coloured mandible, distributed amongst the zoecia, occupying a distinct area, and replacing a cell. *Oœcia* somewhat elongate, smooth, with a central keel running from the margin to the summit, and on each side of it, close to the margin, a fossa.

Very common.

This handsome species is undoubtedly identical with the *M. lineata* of MacGillivray's work on the Polyzoa of Victoria, but has no claim whatever to the Linnean name.

M. vitrea, n. sp.

Zoecia regularly ovate, area occupying the whole front, and closed in entirely by membrane, margin thin, smooth; two rather stout spines on each side at the top. *Oœcium* smooth, glassy, broader than high, rather flattened, with a raised triangular figure in front, from the apex of which a rib passes off to the back. *Zoarium* forming a delicate network of very fine glassy material.

Off Curtis Island.

M. radicifera, n. sp.

Zoarium attached by numerous radical fibres, originating in clusters from each cell.

Zoecia very large, quincuncial, ovate, area occupying the whole front, with a membranous covering, margin rather thin and smooth; two short and stout spines at the top of the cell, and a little below it, on one side, a single forked spine; on the opposite side, a very large sessile *avicularium*, placed on the margin, and occupying a great proportion of the side,

with a rather slender, pointed mandible, directed upwards; the beak hooked at the extremity, and somewhat turned over towards the area; occasionally an *avicularium* on both sides.

Oæcium (?).

Not uncommon, spreading over mud.

This very interesting species presents some striking peculiarities. From the dorsal surface of each cell a cluster of very long slender tubes, or fibres, is given off, so that the under side of the zoarium is completely villous. This is quite an anomaly, and points to some peculiarity of habitat. Usually the members of this family adhere directly by the lower surface of the zoarium, which is closely soldered to the body over which the polyzoon spreads. The specimens on which the radical fibres were observed had evidently been growing on a soft mud, filled with small particles of shell, stone, &c., into which the long rootlets had penetrated, holding the polyzoon firmly to its place. The ordinary structure had been modified in a very marked way to meet the conditions of the special habitat. Whether this is constant in the species as it now exists, or whether it is an exceptional adaptation to peculiar circumstances, I am not in a position to say. The structural modification existed in all the specimens examined. We have instances of remarkable plasticity in the radical appendages of the *Cellulariidae*; but in this case the very existence of such an appendage is an anomaly. The only parallel is afforded by another Australian species (*Cribrilina ferox*), in which Captain Warren's collection has enabled me to detect a similar structure. There is also a peculiarity in the mode in which the cells are united in this species, to which I can only refer as full of interest.

M. permunita,* Hincks.

* Described and figured from specimens in Captain Warren's collection, in the *Annals of Natural History*, for February, 1881, p. 151.

Very common. This is one of the most abundant species amongst the dredgings from Bass's Straits.

M. (Lepralia) trifolium, MacGillivray.

M. (Caleschara) denticulata, MacGillivray.

This interesting form occurs, both incrusting and with an erect bilaminar zoarium.

M. punctigera, n. sp.

Zoecia elongate-oval, somewhat flattened at the top, and usually running to a point below; aperture ovate or elliptical, with a membranous covering occupying more than three-quarters of the front, the remainder being filled in by a thin, minutely granulated lamina, which is continued up the sides as a narrow edging; margin raised, thin, smooth; at the bottom of most of the cells an *avicularium*, slightly raised, with an acute mandible, directed upwards; *oecia* rounded, rather shallow, smooth and silvery; on the front an area inclosed by a raised line, which is minutely pitted over.

On *Retepora*, &c., off Curtis Island.

M. inornata, n. sp.

Zoecia quincuncial, shallow, obscurely six-sided, often rounded at the top and bottom; margins thin, smooth; aperture occupying the whole of the front, with a stout membranous covering, which lies on a level with the rim of the cell; orifice placed at the very top of the aperture, in a kind of recess in the margin, much broader than high, the margin rising a little above it. *Oecium* (?)

Zoarium, flat, depressed, of a brownish colour.

On shell.

This species is related to the British *M. hexagona*, Busk, but has much larger and much less regularly hexagonal cells. The orifice also differs from that of the British species, which is small, almost semicircular, and placed at some distance from the top. The brown colour of the zoarium is another distinctive character.

[The following species is placed provisionally in the genus *Membranipora*. It has the Membraniporidan cell, the characteristic Flustrine habit (though without the flexible membrano-calcareous zoarium) and the marginal rib, which distinguishes the *Flustramorpha* of Gray.]

M. roborata, n. sp.

Zoarium erect, calcareous, bilaminate, compressed, the stem expanding slightly upwards, divided and subdivided dichotomously into narrow segments, a thickened rib along the margin, composed of tubular fibres laid closely together, which at the base form a tuft of rootlets. *Zoecia* quincuncially arranged, ovate, often running out to a point below; margin thin, smooth, two short and rather stout spines above; aperture ovate, occupying the whole front, with a membranous covering, depressed, the cell-wall surrounding it minutely granular, expanded below; above each cell two raised and pointed avicularia placed side by side, the mandible directed downwards. *Oecium* mitriform, flattened and smooth in front, surrounded by a thickened border, which rises into a blunt point in the centre.

Off Curtis Island, abundant.

Family Microporidae.

MICROPORA, Gray.

M. coriacea, Esper, var.

The specimens from this locality are destitute of the marginal knobs on each side of the orifice, but in other respects agree with the ordinary form. The avicularia are much more freely developed than on British examples.

STEGANOPORELLA, Smitt.

S. magnilabris, Busk.

The zoarium, which is commonly found incrusting, consists of erect, bilaminate, foliaceous expansions of considerable size.

Off Curtis Island.

Family Cribriliniæ.

CRIBRILINA, Gray.

C. radiata, Moll.

C. ferox, MacGillivray.

This species, as it occurs in Bass's Straits, exhibits the remarkable peculiarity which I have described in *Memb. radiciifera*.

C. tubulifera, n. sp.

Zoecia oval, white, the front occupied by a flattish area of about the width of the orifice, which is inclosed (except above) by a row of erect tubular processes (about fourteen), open at the top; the inclosed space crossed by shallow depressions or furrows, in each of which are situated four rather large pores; numerous minute, slightly raised foramina, irregularly distributed; outside the line of tubercles the cell-wall, which descends abruptly, is broken up into a number of lobate processes, separated by narrow, elongate spaces; orifice arched above, lower margin straight, peristome not raised, three spines above, two of which are usually very slightly divided at the top. *Oœcia*. (?)

Two small colonies have occurred.

C. speciosa, n. sp.

Zoarium of a brownish colour; *zoecia* large, usually elongate-ovate (sometimes shorter), quincuncial, distinct, not very convex, carinate, a large proportion of the front occupied by an oval area, traversed down the centre by a prominent keel, from which ridges (7-12) pass to the border, the furrows between them not punctured; area surrounded by a narrow border of smooth cell-wall; orifice suborbicular, rather contracted below; no spines or *avicularia*. *Oœcium* large and rounded, smooth, dense, whitish, slightly flattened in front, and above the flat space rising into a knob, from which a shallow, sigmoid fissure descends on each side.

A fine handsome species.

Off Curtis Island.

? *C. monoceros*, MacGillivray.

Zoëcia subcylindrical, flattish, highly calcified and almost confluent in older states, the whole of the front surface pierced by numerous pores of various shapes and sizes, some of them large; orifice well arched above, lower margin straight, with a strong, central mucro, on the front of which is a small pointed *avicularium*, the mandible directed upwards; immediately above the orifice two or three small pointed *avicularia*; four oral spines, two on the upper margin, tall, slender, forked at the extremity, and two (placed one on each side) just within the peristome, immediately above the lower margin, articulated, tall and very stout, forked; frequently great numbers of *avicularia*, of various forms, distributed over the zoarium. *Oœcium* rounded, sub-immersed, smooth, often with a thickened rib round the opening, and bearing usually several small *avicularia*.

Very common on shells, &c.

This form is doubtfully referred to MacGillivray's species; it is allied to *C. punctata*.

Family Microporellidæ.

MICROPORELLA, Hincks.

M. ciliata, Pallas, vars.

Several forms of this very variable species occur, and amongst them the striking hooded variety (*personata*), which is common on shells.

M. Malusii, Audouin.

M. diadema, MacGillivray, var.

A marked variety occurs (not noted by MacGillivray); it is highly calcified, and strongly areolated round the margin, ribs radiating from it towards the central pore, around which there is a smooth space. The species is hardly recognisable at first in its altered guise.

M. mucronata (*Eschara*), MacGillivray*

Very abundant. This species belongs to the same section of the genus as our British *M. violacea*, to which it is nearly related. In the earlier stages of its growth it is simply crustaceous, but the adult form is erect and branching.

MONOPORELLA, n. gen.

Gen. character.—*Zoecia* destitute of a membranous area or aperture, and of raised margins; orifice arched above, with the lower lip entire; no special pores.

M. nodulifera, n. sp.

Zoecia massive and thick-walled, ovate, irregularly disposed, of a brownish colour; a depressed area, extending downwards from a little below the orifice, and occupying a large proportion of the front, the cell-wall elevated around it, surface minutely roughened and punctured; orifice arched above, inferior margin straight, peristome slightly raised; three spines on the upper edge, with black bases; at each side of the orifice, on a level with the lower margin, a prominent nodule, often of a rich brown colour and polished.

Oecium (?)

Only a single colony of the present form has occurred, on shell.

M. lepida, n. sp.

Zoecia hexagonal, very regular in shape, quincuncial, separated by somewhat shallow sutures and raised lines, slightly convex, surface minutely granular, shining, of a delicate greyish colour; orifice arched above, lower margin straight, rather raised and everted, much broader than high, peristome thin; a rather large circular pore on each side, a

* This species is, I think, identical with the *Eschara lichenoides* of Busk, but not of Milne-Edwards. It is not improbable, too, that the *Eschara coscinophora* of Reuss may be the same thing, in which case the latter name must be adopted.

little below the orifice, and often a few others, usually smaller, round the edge of the cell. Occasionally an *avicularium*, placed on a distinct area, at the bottom of a cell, mandible directed upwards. *Oæcium* globose, prominent, granular.

A very pretty species, singularly regular and neat in appearance.

On shell, off Curtis Island.

Family Porinidæ.

PORINA, D'Orbigny.

P. (Eschara) gracilis, Lamouroux.

Zoarium erect, irregularly branched, branches somewhat compressed. *Zoecia* elongate, confluent, quincuncially disposed, the wall rising towards the orifice, surface reticulato-punctate; orifice, in young cells, arched above, the lower margin slightly curved inward; in adult cells, suborbicular, moderately raised, peristome thickened, and bearing several (sometimes as many as six) round *avicularia*; at a very short distance below the orifice, an elongate pore, which frequently becomes round as calcification proceeds. Small circular *avicularia* often distributed irregularly over the cells. *Oæcia* (?).

Curtis Island, not uncommon.

In young cells, the elongate-oval pore is sometimes surrounded by a raised border composed of large perforations.

Family Myrizoidæ (part), Smitt.

SCHIZOPORELLA, Hincks.

S. Cecilioi, Audouin (= *Lepralia crystallina*, MacGillivray). Common and very fine.

S. biaperta, Michelin (? = *Lepralia megasoma*, MacGillivray).

Both crustaceous, and with an erect, branching zoarium, the branches cylindrical. The latter form often attains a luxuriant growth.

S. circinata, MacGillivray. On shell.

S. obliqua (*Eschara*), MacGillivray. Abundant.

S. triangula, n. sp.

Zoecia subquadrangular, depressed, arranged in linear series, bordered by a raised line, surface reticulato-punctate, or thickly covered with nodules; orifice subtriangular, margin not raised, a sinus below marked off by two dentate processes; immediately below the orifice, an elongate *avicularium*, with pointed mandible directed straight downward, either immersed, or with the beak standing out prominently; *Oecium* very large, rounded, often traversed by raised white lines, with one or more projecting, pointed processes on each side in front, overhanging the opening, and opposite to them on the lower margin two (sometimes more) strong conical teeth; surface covered with large nodules and punctured; orifice of the ovicelligerous cell very large, elongated transversely, with a slightly sinuated lower margin.

Bass's Straits, 40 fathoms, &c. Common.

The zoecia are often very irregularly disposed, turned in all ways, and variable in shape. They are sometimes much more convex than is usual, and ovate, losing much of the normal appearance.

These irregularities occur amongst the secondary cells which are developed upon the primitive layer; the typical character is very constant in the primaries. *S. triangula* belongs to the *S. linearis* group.

S. tumida, n. sp.

Zoecia ovate, disposed in linear series, which radiate in all directions from a centre, perfectly smooth, moderately convex; orifice arched above, lower margin straight, with a rounded sinus in the centre, peristome not raised; immediately below the orifice a pouch-like swelling, bearing on its upper surface a small rounded *avicularium*; frequently an ovate rising on one side of the cell, extending from the

orifice down a considerable portion of its length, bearing at its upper extremity an immersed avicularium, with pointed mandible directed downwards; *Oœcium* globose and prominent, with a smooth surface.

On shell.

S. acuminata, n. sp.

Zoœcia short, usually lozenge-shaped (somewhat irregular), flattish, quincuncially disposed, bordered by a smooth raised line, an acuminate, suberect extension of the cell-wall behind the orifice, the apex or peak of which is slightly bent forward, and occupied by a smooth nodular prominence; surface thickly covered with minute punctures; orifice semicircular, with a rounded sinus on the lower margin, contracted at the opening and expanded below, rim slightly thickened; on one side, a little below the orifice, an *avicularium*, with pointed mandible directed upwards; *Oœcium* occupying the place of the acuminate extremity of the cell, large, rounded, deeply immersed, the opening the same as that of the cell, but larger than the ordinary orifice, closed by the opercular valve, surface punctate.

Off Curtis Island. A single colony.

A remarkable form, distinguished by the elevated, peak-like upper extremity of the zoœcium.

HIPPOTHOA, Lamouroux.

H. divaricata, Lamx. On *Retepora*, 40 fathoms, Bass's Straits.

H. distans, MacGillivray (= *H. flagellum*, Manzoni). On shells, &c., common. MacGillivray's name, which has precedence in time, must be substituted for that of Manzoni.

Family Escharidæ (part), Smitt.

LEPRALIA, Johnston (part).

L. cleidostoma, Smitt, var.

This form differs from Smitt's species in having a rather

large circular avicularium, placed on an elevation at one side of the orifice and looking towards it, instead of a pointed avicularium. The oecium of *L. cleidostoma* is described as striated; that of the present variety is usually smooth and silvery; but I have met with one that was distinctly marked by radiating lines, or slight ribs. On the whole, I can see no sufficient reason for separating the two forms.

Common in Bass's Straits. [Florida (Pourtales)].

L. Poissonii, Audouin. (? = *Escharella setigera*, Smitt.)

Common on shells, Retepores, &c.

Little has been heard of this species since it was first figured by Savigny in his great work on Egypt. Its remarkable peculiarity is the line of spines fringing the base of the cell, for about half its length.

PORELLA, Gray.

P. concinna, Busk. Not uncommon.

P. marsupium, MacGillivray. Very common; one of the most abundant species amongst the dredgings. *P. marsupium* is nearly related to *P. minuta*, Norman.

SMITTIA, Hincks.

S. Landsborovii, Johnston, var. *purpurea*. Common.

This differs from the English form in colour, being commonly of a rich purple. It exhibits another peculiarity which I have not met with before in this species. The oecium is hooded, and in the fertile cell the peristome gives off two processes in front, which meet across the orifice, leaving a circular opening through which the avicularium is visible. These, however, are merely varietal differences.

S. trispinosa, Johnston. Common.

S. reticulata, J. MacGillivray. Normal form, one or two small colonies.

S. reticulata, var.

The avicularium always placed *on one side* of the sinus close to the peristome, directed downwards, elongate, some-

times of great length, the mandible of much the same width throughout, rounded at the extremity. In all essential characters this form agrees with the normal *S. reticulata*; but the avicularium is modified in shape, and is constantly placed in a different position. In the usual form it is situated centrally, immediately below the sinus, and is furnished with an acute mandible. Though the variation is comparatively trifling, it affects very materially the appearance of the species.

MUCRONELLA, Hincks.

M. porosa, n. sp.

Zoëcia long and rather narrow, or of a shorter and more ovate form, moderately convex, rising towards the orifice, depressed towards the base; orifice ample, suborbicular somewhat flattened below, with a broad tooth inside the inferior margin and a sharp denticle on each side; immediately below the tooth a large massive mucro, swollen at the base, bearing on one side an *avicularium* with rounded mandible directed upwards; a small *avicularium* (also rounded) on the margin at one side of the mucro; walls of cell strongly calcified; surface thinly covered with rather large deep pores,—in older states reticulate. *Oæcium* large, rounded, of considerable width, thickly and minutely granulated, or reticulate, slightly flattened in front, white and silvery.

Off Curtis Island.

M. spinosissima, n. sp.

Zoëcia small, lageniform, the peristome elevated, suberect, forming a neck, surface perfectly smooth, of delicate, subhyaline material, a row of punctures round the base; orifice suborbicular, a broad tooth on the lower margin, the rim of the elevated peristome set round with about eight spines; the front margin carried up into a broad tooth-like mucro; *Oæcia* globose, perfectly smooth, recumbent.

Avicularia none.

Off Curtis Island on *Retepora* and *Flustra dissimilis*.

M. teres, n. sp.

Zoecia ovate, quincuncially arranged, convex, divided by deep sutures, in which an inconspicuous line is traceable, punctured round the edge, the cell-wall rising towards the orifice, which is borne on a short neck, surface perfectly smooth, whitish; orifice suborbicular, a tooth on the lower margin, the peristome carried up into a central mucro in front, on the inner side of which is a small nodular projection, six spines round the upper margin; *Ooecium* globose, smooth, somewhat recumbent, two spines showing on each side in front of it.

Allied to our *M. ventricosa*.

Off Curtis Island, on shell.

M. tricuspis, n. sp.

Zoecia broad-ovate, quincuncial, moderately convex, smooth or slightly roughened, hyaline; orifice transversely elliptical, three tall spines above it in front, closed in by a screen-like elevation, which in the centre rises into a dentate process rounded at the top, and on each side of it into a projecting lobe, a furrow down the middle of it; on each side of the cell about half-way down it, a raised *avicularium*, with a slender pointed mandible directed outwards; *Ooecium* globose, smooth, silvery, with a projecting rim round the opening, the *avicularia* of the neighbouring cells flanking it on each side.

Very abundant.

RHYNCHOPORA, Hincks.

R. longirostris, n. sp.

Zoecia pyriform, ventricose above, narrowing off and depressed towards the base, quincuncially disposed, rather coarsely granulated, with a line of perforations round the edge; orifice (primary) transversely elliptical, perfectly simple; secondary orifice formed by the elevation of the

peristome, subelliptical or irregular in shape, and of large size, the margin frequently bearing a number of short spinous processes, which give it an irregular and jagged outline; within the lower lip, a large, bluntly pointed process, which stretches across on one side almost to the margin, and forms with it a kind of loop; immediately behind this process a massive mucro, which bears on its inner aspect an *avicularium*, with a short triangular mandible directed upwards; commonly on the front of the cell a raised *avicularium*, with a very long mandible, rounded at the apex, and usually pointing downwards; *Oœcium* rounded, shallow, smooth, often sub-immersed, the opening closed by a calcareous operculum.

Off Curtis Island, on *Retepora*.

R. bispinosa, Johnston.

RETEPORA, Imperato.

R. monilifera, MacGillivray. Abundant.

R. robusta, Hincks.

R. granulata, MacGillivray.

Family Celleporidæ.

CELLEPORA (part), Fabricius.

C. albirostris, Smitt. A fine, dark-coloured species, which is not uncommon, incrusting sponges, &c.

[Florida, Pourtales.]

C. levis, Haswell. Only a small colony has occurred; it is in the crustaceous state, and bears a close resemblance to a *Schizoporella*. Haswell represents the adult zoarium as composed of "thick, subcylindrical, sometimes anastomosing branches."

[Queensland, Haswell.]

C. mammillata, Busk.

C. granum, n. sp.

Zoœcia erect, ovoid, smooth, distant, those of the uppermost stratum more or less separated by the cells of the

one below it; orifice quite terminal, suborbicular, with a very marked pointed sinus; peristome elevated around it, and carried up in front into a tall central rostrum, which bears at the top, on its inner aspect, a small oval *avicularium*; peristome on each side of the rostrum rising into a point. *Oæcium* rounded, smooth, a flattish, semicircular space on the front, inclosed by a raised edging and traversed by radiating lines. *Zoarium* forming small, subglobose patches.

Off Curtis Island, common.

Family Selenariidæ, Busk.

LUNULITES, Busk.

L. incisa, n. sp.

Zoarium conical, well raised; beneath flat, divided into lobes round the edge, porous. *Zoæcial orifices* occupying a kind of furrow between the lines of *avicularia*, separated by short spaces, depressed, the cell-wall rising around them, elliptical, with a narrow, well-marked sinus on the lower margin. *Avicularia* short, suberect, pointed; mandible probably triangular, turned in different directions.

All the recent species of *Lunulites* hitherto described are furnished with vibracula. The present form is referred provisionally to this genus.

SUBORDER CYCLOSTOMATA, Busk.

Family Crisiidæ.

CRISIA, Lamouroux.

Crisia ? sp. Fragments of a species occur, which I have not yet determined.

Family Tubuliporidæ.

STOMATOPORA, Bronn.

S. Johnstoni (?), Heller.

One or two specimens of a *Stomatopora* occur, creeping over shell, which may probably belong to this species. The cells are at first in single series, and then range in pairs,

the free extremities of which are closely united, and stand erect. Occasionally single cells are interposed.

TUBULIPORA, Lamarck.

T. capitata, n. sp.

Zoarium white, wholly adnate, composed of a number of capitate or clavate portions, which originate one from the other by means of a slender, stem-like base, and form a linear series, slightly branched. *Zoæcia* slender, minutely speckled, with a circular orifice, disposed radiately on the expansions, the anterior half erect. *Gonocysts*, consisting of an irregularly shaped inflation of the surface, thickly covered with minute puncta, freely produced, sometimes as many as three on an expansion.

On shell.

IDMONEA, Lamouroux.

I. radians, Lamarck.

I. Atlantica, E. Forbes.

A fragment occurs, bearing gonocysts, which has all the characters of this species.

ENTALOPHORA, Lamouroux.

E. ? sp.

A fine species of this genus occurs in considerable abundance. I am unable at present to say whether or not it is identical with any of the numerous fossil and recent forms which have been described.

DIASTOPORA (part), Lamouroux.

D. suborbicularis, Hincks.

D. patina, Lamarck.

On shell.

Family Horneridæ.

HORNERA, Lamouroux.

H. foliacea (*Retihornera*), MacGillivray.

Very fine and abundant. The gonocysts, which have not yet been described, are present on some of the specimens.

Family Lichenoporidae.**LICHENOPORA, DeFrance.*****L. hispida*, Fleming.**

NOTE.

There are two or three species of *Catenicella* in the Collection (besides those included in the foregoing list), which I must of necessity leave undetermined, as I have not access at present to all the papers that have been published on this characteristic Australian group.

SUPPLEMENTARY REPORT ON FORAMINIFERA AND SPONGES,

DREDGED UP FROM THE GULF OF MANAAR, TOGETHER WITH
OTHERS FROM THE SEA IN THE VICINITY OF THE BASSE
ROCKS AND FROM BASS'S STRAITS, PRESENTED TO THE
LIVERPOOL FREE MUSEUM BY CAPTAIN W. H. CAWNE
WARREN.

By H. J. CARTER, F.R.S., ETC.

AFTER my Report on the specimens from the Gulf of Manaar had been published,* I received for examination, through my friend, Mr. Thomas Higgin, F.L.S., of Liverpool, a few more specimens, dredged up from the Gulf of Manaar, together with some from the sea in the vicinity of the Basse Rocks, off the S.E. coast of Ceylon, and from Bass's Straits, between Australia and Tasmania, forming the remaining portion of the same collection, presented to the Liverpool Free Museum by Capt. W. H. Cawne Warren in 1879.

With reference to the specimens from the Gulf of Manaar, which were obtained opposite Tuticorin, and those from the sea in the vicinity of the Basse Rocks (altogether very few in number), there is little to be said beyond the fact that they present the same facies, and are of the same kind as those already noticed; but as they contain a few new species, as well as a repetition of others already mentioned, it will only

* See "Preliminary Report," in the *Proc. Lit. and Phil. Soc., Liverpool*, for 1879-80, vol. xxxiv., p. lvii., and pp. 273-282. Also "Report," in the *Annals and Mag. Nat. Hist.*, June, 1880, pp. 437-457, plates xviii. and xix.; July, 1880, pp. 35-61, plates iv., vi.; Aug., 1880, pp. 129-156, plates vii. and viii.

be necessary to describe the former, and to give the rest together in a list at the end of the Report.

Among the new species is a *Rotalia*, which is almost a facsimile of *R. spiculotesta*, but with an *arenaceous* covering, which enables me once more to state my reasons for regarding *Squamularia varians* and *S. scopula* as not only allied, but as furnishing instances of the lowest and least complicated forms of the nautiloid test among the Foraminifera; while the presence of *Gypsina melobesioides* intercalated with the layers of a *Melobesia*, and plentifully accompanied by *Holocladina pustulifera* and *Carpenteria utricularis*, together with a variety of sponges and other minute organisms in small quantities, testifies not only to the great part which the Foraminifera have taken in the formation of many of these so-called "Melobesian nodules," but to the number of beings which have lived on and have become overgrown by the laminæ of which they are chiefly composed, during their progressive formation.

Among the new species of sponges may be mentioned *Cliona Warreni* (so designated to commemorate not only the gift of these valuable specimens, but their having been dredged from the bottom of the sea also by Capt. Cawne Warren), together with two new species of *Discodermida*.

Again, with reference to the specimens from Bass's Straits referred to me for observation, it may be stated, briefly, that they chiefly consist of calcareous Polyzoa, which have overgrown different kinds of sponges, whose forms they now respectively represent; for in many instances the sponge may be seen inside the case formed by the Polyzoa. Indeed, it looks as if these specimens had been dredged from a bed of sponges, which had become invaded, overgrown, and thus more or less destroyed, by a *colony* of Polyzoa.

Among the sponges, however, there are a few interesting forms which can easily be recognised as *new species*; viz.,

two which appear to belong to the genus *Axos*; also a *Dictyocylindrus*, marked by an unusual development in quantity of the echinating spicule, and a specimen of *Echinonema typicum*, which, together with *E. anchoratum*, from other collections, I have fully described, having hitherto only mentioned them by name. There are also several specimens of *Dysidea Kirkii*, Bk., an Australian species of my group "Arenosa," among the "Psammonemata," which appears to be exceedingly abundant everywhere on the southern coast of this great continent, although the Bass's Straits specimens in particular are not very fine; still it has afforded me an opportunity of going into the whole history of *Dysidea*, and of giving a full description of the Australian species from the total number of specimens of the latter that have come under my observation.

Following is the supplementary list of Foraminifera and Spongida. Specimens from the Gulf of Manaar and the Basse Rocks are indicated by the abbreviations G. M. and B. R. respectively :—

FORAMINIFERA.

- Polytrema miniaceum*. G.M.
 „ *cylindricum*. G.M.
Carpenteria utricularis. G.M.
Gypsina melobesioides. G.M.
Rotalia spiculotesta. G.M. and B.R.
 „ *arenacea*, n. sp. G.M. and B.R.
Holocladina pustulifera. G.M.

SPONGIDA.

- Halisarca rubitingens*, n. sp. prov. G.M. and B.R.
Chondrilla nucula. G.M.
Hircinia fusca. G.M. and B.R.
 „ *clathrata*, n.sp. G.M.
Tubulodigitus communis. G.M.

- Oceanapia* (*Desmacidon*, Bk.) *Jeffreysii*—Australian variety,
viz., without bihamates. B.R.
- Microciona* *atrosanguinea*. G.M.
- „ *affinis*. G.M.
- „ *quinqneradiata*. G.M.
- „ *fascispiculifera*. G.M.
- Hymeraphia* *eruca*. G.M. and B.R.
- „ *unispiculum*. G.M. and B.R.
- Amorphina* *megaloraphis*, n. sp. B.R.
- Esperia* *serratohamata*. G.M.
- Hymedesmia* *stellivarians*. G.M. and B.R.
- Cliona* *Warreni*, n. sp. G.M.
- Placospongia* *melobesioides*. B.R.
- Samus* *anonymus*. G.M.
- Thoosa* *socialis* (with flesh spicules). G.M.
- Geodia* *ramodigitata*. G.M. and B.R.
- Stelletta* *euastrum*. G.M.
- „ *crassicula*, n. sp. B.R.
- Corallistes* *verrucosa*. G.M.
- Discodermia* *aspera*. G.M.
- „ *laevidiscus*. G.M.
- „ *sinuosa*, n. sp. G.M. and B.R.
- „ *sceptrellifera*, n. sp. G.M.
- Leucortis* *indica*, Häckel.

SPECIMENS OF SPONGIDA FROM BASS'S STRAITS.

- Halisarca* *bassangustiarum*, n. sp. (prov.)
- Dysidea* *Kirkii*, Bk.
- Oceanapia* (*Desmacidon*) *Jeffreysii*. The Australian variety,
D. fistulosa, Bk.
- Echinonema* *typicum*, n. sp.
- Dictyocylinrus* *reticulatus*, n. sp.
- Halichondria* *plumosa*. Variety.
- Acanthella* *stipitata*, n. sp.

Halichondria incrustans.

Spirastrella cunctatrix, Sol.

Latrunculia purpurea, n. sp.

Axos anchorata, n. sp.

„ *fibulata*, n. sp.

Tethya lyncurium, ? *Cliftoni*, Bk.

Leucetta ? *primigenia*, Häckel.

Besides the above, there are more or less of the remains of many other species, once fine specimens, but now encased by calcareous Polyzoa, and more or less destroyed, as before mentioned.

NOTE.—The detailed description of new species, &c., will be found published in *Annals and Magazine of Natural History*, for May, 1881, pp. 861-885; pl. xviii.—T. H.

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